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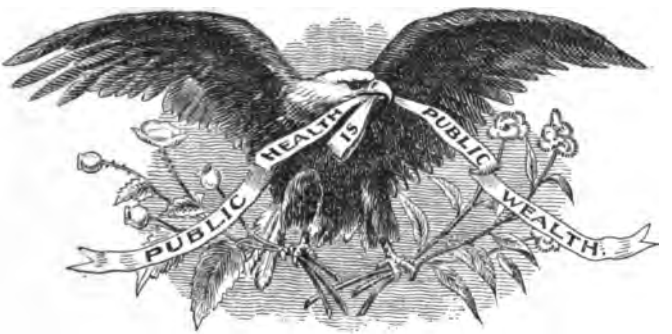
SANITARIAN,

A MONTHLY MAGAZINE

DEVOTED TO THE

PRESERVATION OF HEALTH, MENTAL AND PHYSICAL CULTURE.



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THE ECONOMICAL AND EFFICIENT DISPOSAL OF THE HOUSEHOLD GARBAGE OF NEW YORK.

A CONJOINT ESSAY.*

By Drs. THOMAS H. MANLEY and DOUGLAS H. STEWART, of New York.

PART I.

A WELL-EQUIPPED domicile; a house, or a healthful human habitation, constructed on modern sanitary principles, in a modern city, is not altogether unlike a living, breathing animal. It must rest on a sound, dry foundation; its interior must be well sheltered and protected from the effects of extremes of atmospheric changes; it must be well ventilated and watered.

Facilities should be provided for not only the admission of an abundance of air and water, but there will likewise be provided ample escape for them after having been utilized.

Besides, the house is to be clothed, fed, heated, cooled, cleaned, and its interior periodically renovated.

Exclusive of those materials provided by nature, food, furniture, and raiment must be intermittently supplied to the occupants.

In the natural order of things, the accumulation of waste or residue will be in direct proportion to the volume of supply.

Our needs of the grocer's and butcher's provisions are daily; but for him who supplies our fuel, our clothing, and our furniture our demands are only occasional.

* Read at a meeting of the Section on Public Health, New York Academy of Medicine, December 5th, 1894.

Of all the aliment which is assimilated for purposes of nutrition, it should be remembered that though appropriated by the economy and chemically changed it is not destroyed, for matter is indestructible. It is therefore evident that we may borrow from nature, but we cannot rob her.

At the present time modern science and mechanical skill have enabled us to dispose of but one class of residuary elements from the interior of our households with any degree of satisfaction and certainty. The residue of alimentation is accumulated and conveyed away to the ocean, through means of a vastly expensive system of sewerage, liable at any time to become defective, and certain in the near future to require renewal or reconstruction. This system, though satisfactory at the present, is not economical; and through the sewerage waste which it annually entails, the soil, wherein it was intended it should be deposited, is robbed of its natural fertilizer.

HOUSEHOLD REFUSE.

In every well-conducted household there is a large, diurnal accumulation of what is commonly designated garbage—of swill, ashes, sweepings, the general household refuse, as tin cans, broken delf, articles of clothing, paper, leather, and other extraneous substances too numerous to mention.

All of these heterogeneous materials are now promiscuously thrown together, into a common receptacle, which during part of the time is stored somewhere, under cover within the stoop-line, until the ashman calls and takes it away.

When the weather is favorable and the working force on the Street Department permits it, these receivers are regularly emptied and their contents carried away to the "dump."

Legitimate and Illegitimate Household Garbage.

For several years past there has been considerable discussion on the question of how the city's garbage may be most economically gathered, transported, and disposed of, with due regard to the public health; whether the present, slovenly, extravagant, unscientific, and insanitary system be maintained, or that the garbage be treated by desiccation, cremation, or transportation into the country for fertilizing purposes.

But nothing further than some unimportant, abortive

changes have been temporarily tried, and the vast, unwieldy nuisance continues; its underlying, fundamental defects still untouched; our city's scavengering yet remaining far behind that of all the principal cities of Europe, and, indeed, it may be said, with all truth, it in no sense is equal to that of many of our rival cities of the West.

The time, however, is now opportune not only for the improvement of the Street Cleaning Department of New York, but its extinction; for the conditions of things demand a radical revolution of the whole system, that the sanitation of dwellings, the accumulation of their waste, and its scientific disposal should come within the province of the Board of Health, and be totally divorced from its present, unnatural union with the cleaning of streets.

In order that we may approach the study of this question on scientific lines, it is important that we first have a correct idea of what is to be understood by the term garbage, and whether or not it may not be practicable and profitable for owners and occupiers to now vastly reduce its volume on their own premises.

With this purpose in view, we have ventured to divide household refuse into

1. *Legitimate;* and, secondly, the *illegitimate.* In the former comes, first, the products of the combustion of fuel for heating and cooking.

2. Sweepings of the apartments, areas, and yards.

3. Though entitled to a doubtful position in this category, comes vegetable and animal refuse—swill.

Of the illegitimate group comes, firstly, what may be designated junk, as broken glass, bottles, rags, paper, all the metals, in every form and shape, and other materials in infinite number. Secondly, all such offal or by-products as are derived from industries or trades carried on in one's own domicile.

Financial Basis of the Proposed New System.

As a primary step in this reform it will be imperative that landlords, householders, or tenants are compelled not only to keep their premises cleared of every description of refuse, but that they also are required to pay for its removal. The prin-

cipal object of this last proviso, is to enforce on all householders, indiscriminately, habits of economy, and to relieve the city of a needless expense.

Let us commence with coal-ashes, which we will all admit would seem a great nuisance to store on our premises, and would be a matter of considerable expense to dispose of.

We are informed, from reliable sources, that the ash residue of well-burned coal is equal to only 6½ per cent, or about 120 or 130 pounds to the ton, a little less than one barrel, say, for each ton of coal burned. Thus, when but one cooking-stove would be used, there would be but two or three barrels a year. Certainly if half-burnt coals are thrown in, and fuel is wasted in this way, the accumulation will be considerably more and the trouble in storing and expense for its removal augmented. The admixture of swill or any other material with this ash should be punished by a penalty. This material, isolated in this manner, could be so stored, that its weekly, semi-monthly, or monthly removal would occasion no inconvenience, and when so prepared has, as we will later see, such a commercial value as will make its collection, storage, and transportation a profitable industry.

Moreover, of late years, in this city, kerosene and gas in tenements and private dwellings, are being largely substituted for coal for cooking purposes; so that it may be said, that now, for at least six months in the year, no coal at all is consumed, except on certain days among a large number of our householders; and in the near future, with the cheapening of gas, adaptation of electricity, and the possible development of some practical and inexpensive system of steam-heating, the domestic consumption of coal will be enormously reduced.

Sweepings.—Accumulations of dust and the ordinary sweepings of our apartments, halls, areas, yards, and sidewalks in the daily aggregate produce but a very small bulk.

It is my belief that all this should go in with the general street sweepings; but it must be only dusty deposits, and vigilance on the part of inspectors will be necessary in order to prevent the privilege from being abused, by other masses of material being swept out into the public highways with it. If this scheme would not commend itself, then these sweepings might be mixed with the ashes.

Household Swill—Animal and Vegetable Refuse.

In former times, in fact, until a comparatively recent date, the soap-man and the swill-man made their regular calls on the housekeeper. The former took the animal products—remnants and *débris* of an animal nature, bones, meat and fats—and exchanged soap for them, or paid for them in cash.

Vegetable refuse was placed in vessels to be daily collected by farmers and others to be fed to cattle and swine. This custom is yet in vogue in many of the smaller provincial cities and towns.

But our late war wrought a great revolution in the domestic economy of the nation. New discoveries, with inventions, and advances in the arts have rendered many of the older industries nearly obsolete and seriously crippled others.

In those years of unparalleled prosperity, growth, and thrift which followed the civil strife, we drifted into habits of reckless extravagance, and probably for a long time have deliberately wasted what would have supported a third of our population were it properly utilized.

From extravagance we have drifted into indolent habits, and through sheer carelessness and indifference have permitted the waste to go on unrestrained.

The vast, fertile West has killed the cattle-growing industry of the East, and flooded our markets with an abundance of better and cheaper meat than we can produce on our own farms.

With the cheapness and abundance of this important aliment, has come, extravagance and waste in its consumption.

The discovery of petroleum, with its extensive substitution and utilization in the arts and industries, has greatly diminished the market value of the common animal and vegetable fats.

Severe sanitary restrictions have driven fat from the city's centre, pig-styes, and cow-sheds, and in consequence have made the collection and transportation of swill more expensive and less profitable than formerly.

With the householder it is altogether much easier to promiscuously throw everything together in the refuse-can than to separate and preserve it, especially so, when, through causes

enumerated, it has become so considerably reduced in pecuniary value.

The time has come, however, when such ordinances should be introduced and enforced as will compel citizens to dispose of their table refuse at their own expense, which, when accomplished, if practicable, will go a long way in solving the problem under consideration; and, immense as the task may seem, we will endeavor to demonstrate that it is not impracticable or visionary when the public is once assured that it will entail no additional expense to householders, and may be readily undertaken, without imposing hardships.

Swill may be disposed of on the premises by cremation in the winter season in any ordinary stove, range, or furnace. Many in this city at the present time so destroy it; but, though this means of disposing of it may be practicable in isolated instances, its general introduction is not feasible, and, moreover, it is neither rational nor economical as a domestic measure.

The swill accumulation of New York City collected in a fresh state daily, and given to animals, either alone or mixed with grain, contains sufficient nutriment to feed and fatten thousands of them.

Two rather formidable difficulties lie in the way of this consummation.

The first lies in the difficulty of introducing the system, of convincing the masses of householders that it is particularly to their advantage and in their interests to separate and so store the table refuse, that it may be daily collected by the public scavenger. Let the people be once assured that this will be daily collected, without any expense to them, rather, possibly, with some profit, and the system will be adopted with alacrity and good will; though for the shiftless and careless penalties must be introduced and rigorously enforced.

But assuming that householders will store their refuse of this character, does it possess sufficient value to warrant any man or number of men to contract to remove this out of the city's limits without expense to the municipality and with substantial profit to themselves?

To this question we may answer with reasonable certainty, yes.

Never in our country's history have draught-horses been cheaper or compulsory idleness among the laboring masses been more general, than at the present time.

This scheme provides a new and vast industry, which though not perhaps highly remunerative yet, would provide steady employment throughout the whole year to a large number of hands.

Only once, assure contractors that material would be in readiness for them, and that they would not be hampered in the performance of their duties by department officials or over-officious housekeepers, and there can be no question, but there would be active bidding for this privilege.

We would urge on you, the importance of giving this matter your earnest consideration, for to us, it seems a plan which, if properly introduced, is reasonably certain to succeed. Should it, nevertheless, be discarded as impracticable, then we must turn to the next most feasible plan of removing and destroying this material, by desiccation, cremation, etc., to which Dr. Stewart will directly invite your attention.

Illegitimate Garbage—Junk.—Why, indeed, the city should be required and expected to encourage extravagant habits in its citizens, as it does, when it proposes to use the treasury's money for removing people's junk, is incomprehensible.

The habitual indolence of the people is so great, and shiftlessness with extravagance the rule with the masses, that they will not put themselves to the trouble of setting aside their waste metals—glass, rags, paper, etc.—for the junk-man, who is always ready to call and pay for them. Householders should be forced into economy in this matter by heavy fines, for, at the present time, the stuff imposes a vast outlay for its removal, both to the dumping-ground and out to sea, and its transportation, is the climax of an awkward, cumbersome system, which belongs to another age. There may be some excuse for burdening the city with the disposal of decomposing animal and vegetable substances, but to expect that junk and other rubbish, which can be readily consumed on the premises, and is always salable, should be conveyed away by the scavenger, is nothing less than a positive imposition.

Its collection will impose practically no additional labor, and its gathering will enlarge an important industry, affording

steady and remunerative compensation to a large number. At the present time junk-dealers pay the city $80,000 a year for the privilege of picking over the city's garbage at the dumps, and then teaming it away ; but why, in the name of common sense, not let them pay some of that money to householders, and spare the city the expense of collecting and carting the refuse ?

Garbage Accumulation from Household Industries.

In this city, there are many, who carry on trades, keep restaurants, and follow pursuits attended with an extensive waste accumulation. This is often blended with common garbage and conveyed away at the city's expense. The same causes which lead to the present custom with ordinary housekeepers have permitted this. The great bulk of this material is salable, or, can be destroyed on the premises ; at all events, its removal is a private affair, which in no manner should involve the least expense to the city.

The two important questions, which concern the individual and the city alike, in any scheme that will reform or revolutionize our present system of destroying or disposing of household refuse, are, first, the sanitary aspect ; and, secondly, the matter of expense.

It is our conviction, that the change suggested, is one which will recommend itself from the standpoint of its healthfulness.

Nothing can give off foul exhalations except swill, but when this is collected in tightly closed, metallic vessels, and is gathered regularly every day, freshly, before decomposition sets in, atmospheric contamination is highly improbable.

After being once put in good working order, there can be no doubt but this material now treated as offal and a nuisance may be a source of revenue to every householder. Certainly it will entail no additional expense, except to the lazy and shiftless, who must be closely watched by the sanitary inspectors and police, and promptly punished for any serious or persistent infraction or violation of the ordinances in force.

INOCULATION FOR DIPHTHERIA AND CROUP.

FROM SPECIAL CONSULAR REPORT ON THE TREATMENT OF DIPHTHERIA AND CROUP BY MEANS OF HYPODERMIC INJECTIONS OF DIPHTHERITIC SERUM, BY C. W. CHANCELLOR, UNITED STATES CONSUL AT HAVRE, FRANCE, OCTOBER 14TH, 1894.

FOR some time Dr. Pasteur, the great French scientist, who has achieved such brilliant success in the treatment and cure of maladies heretofore deemed incurable, such as hydrophobia and malignant pustule, and Dr. Roux, his principal assistant, have devoted themselves to a scientific study of diphtheria and croup, and for the last five years they have asserted that the cure of these diseases by inoculation might be considered an accomplished fact.

But they forbore to make public their valuable discovery until, by frequent experiments conducted by Dr. Roux, they had quite assured themselves what animal was best suited for the transformation of the diphtheritic poison into an antidiphtheritic vaccine. The fact is now established beyond all question that this animal is the horse, and that the antitoxine is contained in the serum of the blood of the animal, prepared according to Behring's method by Dr. Roux and Dr. Merlin, at the Pasteur Institute, in Paris.

The following statistics furnished by the director of the Hospital des Enfants Malades, of Paris, give the result of Dr. Roux's treatment. During the years 1890–93, there were 3971 children treated in the diphtheria annex of the hospital, with the following death-rate for each year:

	Per cent.
1890	55.80
1891	52.45
1892	47.64
1893	48.47

This makes an average of 51.09 per cent for the four years.

When Dr. Roux and his co-workers entered the hospital (February 1st, 1894), they at once began the new treatment

of injecting the antitoxic serum, and of 448 children treated, only 109 succumbed—a death-rate of 24.33 per cent. As every other part of the treatment of the patients was the same as during the four years above cited, the difference between 51.09 and 24.33 per cent is a fair representation of the advantages derived from the serum treatment.

It is, moreover, stated that a number of children not suffering with the disease were inoculated and placed in contact with the diphtheritic patients, living in and breathing the same air meantime, but not one of them contracted the malady. This would seem to demonstrate quite conclusively that the antitoxic serum is not only a curative, but a preventive agent of great power, quite equal to the cow vaccine as a prophylactic against small-pox. In an article recently published in the *Univers*, M. George Duranton, in discussing the new remedy, enthusiastically declares that "diphtheria has been vanquished, and croup has lost its terrors."

In Germany, Drs. Behring, Eslich, Kossel, and Wassenman have tried the serum cure on 220 children suffering with diphtheria, with the result of effecting 168 cures against 52 deaths, or a mortality of only 30.95 per cent. Another striking instance of the efficacy of the cure has been published. M. François Moreau, a young French naval officer, who had just arrived at Vienna from a trip to the East, was attacked with malignant diphtheria, and his life was despaired of. A small quantity of Dr. Roux's vaccine serum was obtained and promptly injected, and although the patient's condition was thought to be desperate, in three hours after the first injection the false membrane, which had almost produced suffocation, became detached, and the disease soon disappeared.

The universal satisfaction occasioned by this conquest of science may be readily imagined. Not only have the parents of rescued children testified their sense of gratitude, but public interest has been aroused to an unusual extent, as manifested in the results of the subscription inaugurated by the *Figaro*, a leading journal of Paris. In three weeks over 200,000 francs ($38,600) have been subscribed for the founding of an institute for supplying the antidiphtheritic serum to the members of the medical profession in France.

So far Dr. Roux has been unable to meet the demand for

the serum, and he has had to confine himself to sending to the provinces only a sufficient quantity for urgent cases; and it is to be feared that this state of things must continue for some time. To provide for the needs of the entire country, the Pasteur Institute would have to possess a permanent establishment of over 150 immuned horses, and, in addition to the heavy expense thereby entailed, the present accommodations are insufficient. Already it has been suggested that auxiliary institutes be established in all the principal towns of France, the expenses to be sustained by the various municipalities. The city of Marseilles has decided to establish an institution, and the municipality of Honfleur, in this consular district, has contributed a liberal sum of money to be applied in the production and distribution of the serum for that particular community.

A plan has also taken practical shape at Rouen and Havre to aid in this great humanitarian work. Individual subscriptions have been made to the extent of 40,000 to 50,000 francs ($7720 to $9650) in the two cities to supply the necessary means of accomplishing the desired end. At Havre, a healthy young Normandy horse of four years old, that has never been put to work, has been purchased, and is now under observation in the stables of the veterinary department of the government at this place. In order to take every precaution, and to insure the success of the experiment, this horse has already been inoculated with *maléine*, an agent which, when inoculated on a perfectly healthy animal, produces negative or harmless results. After this the horse, if perfectly healthy, will be successively and slowly rendered immune by injecting beneath the skin of the neck or shoulder gradually increased doses of the toxine, made by cultivating virulent diphtheritic bacilli exposed to the air. Immunity being thus established in the horse, which requires from six to eight weeks, the serum of the blood of the animal when drawn and injected subcutaneously into the human subject will produce the desired preventive and curative action.

The remedy is given in this manner: Usually the patient receives a single injection of 20 cubic centimetres* of the anti-

* 5.41 drams.

toxic serum; twenty-four hours later a second injection is made of 10 or 20 cubic centimetres, and in most cases the two injections will be found sufficient to effect a cure. In slight cases a single injection of 20 cubic centimetres of the serum has been found sufficient to insure recovery. The serum is prepared in the form of solid dry grains, which preserve their vaccinal power for quite a long time. In a liquid condition the serum preserves its properties for one year. It is kept in tubes of 20 cubic centimetres capacity, containing a small piece of camphor and corked with sterilized india-rubber.

In order to obtain satisfactory results, it is quite essential that every person using the remedy should become familiar with the manner of diagnosing the disease bacteriologically. For this purpose it is only necessary to pass a platinum wire loop over the mucous surface of the tonsilar glands, and then apply the wire thus charged with mucus to a solid culture medium in a glass tube. This is what the French call *ensemencement*. The tube is placed in an oven maintained at 98° F., and if the colonies develop in twenty-four hours, we are in the presence of a culture of diphtheritic bacilli. It is also important to ascertain if the diphtheritic bacilli are associated with other microbes, for, in this case, the serum therapeutics must be much more intense than that ordinarily applied.

The question of supplying the medical profession with properly prepared serum, as small-pox vaccine is now supplied, is one which should be taken up at once by every State and municipal government in the United States, seeing that diphtheria sweeps off fully 60 per cent of all children attacked, and annually causes the death of many physicians, students, nurses, and others who must necessarily come in contact with the disease.

C. W. CHANCELLOR,
Consul.

HAVRE, October 11th, 1894.

SUPPLEMENTARY REPORT.

The Paris *Figaro* of October 12th, 1894, published the following additional information regarding the preparation and distribution of Dr. Roux's antidiphtheritic serum:

"The first proceeding was to effect the purchase of twenty

horses upon which to confer immunity, a process that requires about sixty or seventy days. The first injection under the animal's skin is a mixture of iodium and the toxine—that is to say, a culture of diphtheritic bacilli whose violence is attenuated by the iodium. After the lapse of some days this injection is renewed at fixed intervals, and is continued for six weeks; finally, the pure toxine (that is, the poisonous substance secreted by the bacilli diphtheriæ) is injected, and the horse is henceforth in readiness to furnish the serum on being bled. This operation can be performed every twenty days, after the lapse of which time the animal can supply, without injury or fatigue, 2 litres (2.05 quarts) of blood, which furnishes enough serum to save the lives of forty children attacked with diphtheria or croup.

"Up to last Wednesday (October 11th, 1894) twenty-three horses had been rendered immune at the Pasteur Institute for supplying the antidiphtheritic serum, and thirty-seven additional horses have been purchased by the institute, which are to be treated immediately. The purchase of the horses is conducted by a member of the Academy of Medicine, and, as far as possible, the purchases are made in the government barracks, from among the animals discarded on account of weak legs, but otherwise perfectly healthy.

"At the Pasteur Institute there is a specially organized laboratory for the preparation and dispensing of the antitoxic serum, and two physicians are detailed under the direction of Dr. Roux for this work, which requires great care and precaution. On account of the necessity of this extreme care in the preparation of the vaccine, it is considered indispensable that the service shall be centralized, and it has been decided that no branch laboratory to the Pasteur Institute will be established in France. There will, however, be established, in a few months' time, depots in the central and larger cities for the distribution of the serum, and these depots will receive their supplies directly from the Pasteur Institute for delivery to the doctors making requisition therefor. This plan will be carried into execution in a very short time, thanks to the spontaneous and generous subscriptions of the public, deposited with the *Figaro*, now amounting to 225,000 francs."

It may not be amiss to state that it is now claimed that the

real credit of the discovery belongs to Dr. Behring, of Berlin. The diphtheria bacillus, which was discovered by Loefler, of Berlin, secrets a poison which is the true cause of the great mortality from diphtheria, and Dr. Behring, in studying the properties of this poison, injected greater and greater quantities of the toxine into the horse, and by proceeding gradually and carefully, he found that the animal could absorb enormous quantities of the poison without injury. He subsequently found that in the serum of the blood of a horse thus treated there existed a counter-poison, which Dr. Roux has so successfully introduced to the public. In Germany this antitoxine is known as Behring's remedy for diphtheria and croup, and in France, as Roux's antidiphtheritic serum.

C. W. CHANCELLOR,
Consul.

HAVRE, October 14th, 1894.

COMPLIMENT FOR "EXPERIMENTAL SCIENCE."—Dr. Frank L. James, editor of *National Druggist*, in response to the request of a physician to outline a course of reading for one who desires to begin the study of medicine, says in the course of his remarks:

"In physics the best book to go into the hands of an intelligent beginner is 'Experimental Science,' by George M. Hopkins, published by Munn & Co., of the *Scientific American*. Mr. Hopkins has, in this work, made the study of physics almost as interesting and entertaining to a healthy boy or young man as baseball or cycling. He illustrates principles by experiments, and these latter are made so simple, by careful description and profuse and accurately drawn pictures, that they can be executed by any person with the least ingenuity. The work covers a wide field, and will introduce you to chemistry, microscopy, and other allied sciences. Even if you have studied physics as taught in the high schools, you will find it a most admirable book, one that will be of great use to you in advanced studies."—*Scientific American*.

HEALTHFUL INFLUENCE OF THE FORESTS OF THE SOUTHERN INTERIOR OF NEW JERSEY.

By JOHN GIFFORD.

FOR many years doctors have recommended the piney woods. Health largely depends upon climatic influences, and the effects of forests on climate, although much discussed, have not yet been fully determined. Man by his intelligence is, of course, able more than other animals to overcome climatic barriers. He can live in perpetual winter or summer, and even in large cities, in high altitudes, where the cat with its traditional nine lives perishes. All agree, however, that a temperate climate, with changes, but free from extremes, with a relative humdity of about 75°, is the pleasantest and the most healthful for the majority of people to live in constantly.

Many claim that sunlight is the greatest purifier on earth, and that a forest cover prevents its action. It is certain that sunlight is necessary and that it even destroys such fatal organisms as the cholera germ, but experiment shows that, although many organisms may be present in a forest but few are septic. A forest cover prevents their dissemination, and a mass of trees around a dwelling impedes the dust on the particles of which the germs of disease are carried. A point in favor of pine woods is that they are full of sunlight, and the surface of the soil, being clean and dry, is a poor nidus for organisms.

Vegetation is certainly a great climatic factor, but it will require many years of careful investigation to fully demonstrate its influence. Almost all facts pertaining to the physiology of the plant hold some relation to climatic conditions, no matter how slight, and exercise their influence on the constitution of man. There is a peculiar triangulation on this earth, the nature of one side of which depends upon the nature of the other sides.

The nature of the surface of the earth and the air which

covers it is one side ; the plant world is another, and the animal world the other. Change one and all are changed. Like a complex machine, there are wheels within wheels, constantly whirling and depending on each other. Throw one of these cycles out of its relations, and the whole machinery is more or less affected. Every locality, geographically distinct, must be studied to show the relations of soil, climate, vegetation, animals, and man. The southern interior of New Jersey is an interesting territory for the purpose.

The hygienic influences of forests have been well summarized as follows by Fernow :

"(1) The claimed influence of greater purity of the air, due to greater oxygen and ozone production, does not seem to be significant ; (2) the protection against wind and sun and consequent absence of extreme conditions may be considered favorable ; (3) the soil connections of the forest are unfavorable to the production and existence of pathogenic microbes, especially those of cholera and yellow-fever, and the comparative absence of wind and dust, in which such microbes are carried in the air, may be considered as the principal claim for the hygienic significance of the forest."

The healthfulness of South Jersey is mainly due to the nature of its soil.

The following was clipped from a daily newspaper, and is probably of little consequence :

" Dr. Kingsett, the chemist, recognizing that ozone, the natural purifier of the air, is produced in nature by balsam trees—the pine, fire, larch, and eucalyptus—urges that such trees be planted and cherished on farms and in towns and villages."

In South Jersey the pioneer plants are endeavoring to produce again a forest cover against heavy odds—reckless cutting and shameful burning. The pines are usually the first to appear, because they can grow under a great variety of soil and moisture conditions, but are unfortunately easily damaged by fire.

The pitch pine of South Jersey is usually associated with dry uplands ; it reaches perfection, however, in our dampest swamps.

The southern interior of New Jersey is warmer in winter

and hotter in summer than the country which borders it to the west and north. The sea-shore is warmer in winter than the interior, and cooler in summer than any other part of Jersey excepting the Highlands, which are cold in winter and cool in summer. The southern interior is hilly, ranging from 10 to 200 feet above sea-level. The mildness of the winter climate of the southern interior is usually attributed to the presence of pines. Pine woods offer little shade, and are hotter than an open field, where the wind has a freer sweep. Their influence on the climate is probably very slight. In fact, the pines are rapidly disappearing in South Jersey, being replaced by oaks. This condition of affairs is mainly caused by forest fires, since to pine there is no second growth of consequence.

The climatic condition of the territory referred to is due at least to three factors: (1) The tempering influence of large bodies of water; (2) to the nature of the soil; and (3) to cedar swamps.

Owing to the influence of the ocean, the atmosphere along the shore is mild in winter and cool in summer, but damp. Atlantic City, for instance, is becoming as famous a winter as summer resort; but often in summer, when the wind blows from the west over the southern interior, the atmosphere is not only warm, but humid. Many claim that there is a decided difference in the dampness of the resorts along the shore. The interior is, of course, affected to a certain extent by the tempering influence of the sea.

The soil of the southern interior is sandy. All silicious soils are warm, and when, as in Jersey, coarse, and not covered with humus or dense forests, are dry and hot.

The moisture conditions of pine soils are much influenced by the presence of many stumpholes. This is especially so in South Jersey, where, owing to forest fires, these holes are abundant. Dr. A. N. Bell, in THE SANITARIAN for May, 1893, calls attention to their value in this respect in the following words: "The taproot of the pine, penetrating from a few inches to a few feet in depth, according to the size of the sapling or tree at the time of its death, and its numerous radical branches as they decay, establish a natural system of soil drainage, which may be studied with profit by engineers and agriculturists."

No doubt the main influence of the pines is due to the fact that they offer little shade, and deposit only a thin coating of dry leaves, which only slightly prevents the sun from heating the sandy soil. When the soil becomes hot it dries and warms the atmosphere over it, which, being lighter, continually rises. In a clayey, densely forested or grass-covered country a cool, moist layer of heavy atmosphere hangs over the surface. A sandy region is hot during the day and cold during the night, but a tempering influence of considerable consequence is exerted by cedar swamps, which will be referred to later.

The mineral constituents of the soil appear to be of little consequence in the causation of malaria. This disease probably depends more upon the presence of the conditions which favor the life of the organism which causes it. It prefers fine, moist, fresh alluvium rather than coarse, dry sand, and for that reason malaria is remarkably uncommon in South Jersey, in spite of the fact that there are vast stretches of low swampland, which seem well fitted for its habitat. It may be, however, that the water of South Jersey, which is of a peculiar nature, contains something unfavorable to its growth. Peat is antiseptic, and is many years decaying. A very small portion of the southern interior is cleared land, so that the many streams which flow through it are remarkably pure. This water is the color of mahogany, due to humic matter from the swamps. Many claim for this medicinal properties, owing to the presence of iron and perhaps other substances with slight antiseptic properties.

Many of these streams were dammed long ago for bog-ore forges, furnaces, and saw-mills, and thus many beautiful cedar-fringed ponds were formed. Such locations have been chosen for winter resorts, the most prominent of which are Lakewood and Brown-Mills-on-the-Pines, although there are other places just as well if not more favorably located. Weymouth and Bamber deserve attention because of their natural advantages. Bamber is very beautifully located on the site of an old forge on the edge of a lake of remarkable clearness and purity. It is probably fed by springs in its bottom, since the flow of water is but slightly affected by drought. The majority of these streams and ponds are or have been fringed by swamps of white cedar. These swamps exert an influence on our

climate, rainfall, and flow of water which has been little appreciated, judging from the way they have been despoiled because of the value of the lumber which they yield.

Actual experiment shows that cedar swamps are cooler in summer and warmer in winter than the surrounding fields and woods. Warm air being lighter than cold, it rises, and the cool atmosphere from the swamps rushes out to replace it, and is in consequence heated. Thus the tendency of the swamp is to cool the surrounding atmosphere and to produce local currents of air. In the winter swamps are warmer than the surrounding country, and their tendency at that time is to materially lessen the cold. A cedar swamp bottom seldom freezes. It requires an exceedingly cold winter to affect the flow of water. They are natural reservoirs of water effecting a natural irrigation. To sum it up in a few words, swamps of cedar tend in many ways to lessen the destructive forces of nature. Birds have learned this fact, and rookeries are common there.

It is a common observation that a cloud passes over the dry, sandy regions, but drops in rain when a swamp is reached. It is a common saying that cedar swamps attract a shower. This is easily explained. Suppose a cloud almost to the point of precipitation is moving over a sandy plain. When it strikes the cool air over a swamp, which need be only very slightly cooler, water at once falls.

Enough has been said to indicate that cedar swamps are so valuable to the climate and water supply of South Jersey, that they ought to be carefully grown and cared for on as large a scale as possible. If this is beyond individual interest, and if we are too selfish to think of posterity, it becomes the duty of the State. Cedar swamps lessen the cold of winter and the heat of summer; they increase the amount of rainfall; they maintain a constant water supply; they prevent droughts and floods; they remain always the same in color and beauty, and not only benefit the lumbermen, millmen, and farmers, but indirectly everybody. It must be borne in mind that these influences are not claimed for all forests, but the writer is convinced that the beneficial effects of cedar swamps are manifold. It is the duty of every citizen to convince himself, if possible, of their inestimable value, and to do his part

in preventing ruthless destruction or shameful waste by fire.

We have too little respect for trees. While they are plentiful we think only of their value in gold. We learn of their true usefulness through their absence. Well-watered, productive lands have been suddenly turned into deserts, and with infinite care and years of toil deserts into gardens. Were it not for the trees which cover it, South Jersey would be a bed of shifting sands. The wind in passing over it would become unbearably hot; the streams would dwindle, and this region, instead of being a sanitarium, would become unfit for the habitation of man.

The psychic effect of a forest must not be underrated. One must be callous indeed to not enjoy its beauties. To an invalid who has seen nothing but brick walls it is a valuable diversion.

The effect of color is also of consequence. Instead of the melancholy grays of many clayey, grass-covered countries, in South Jersey the dark and light green of cedar swamps and pine forests and underbrush, and the yellows, white, and browns of fields of sand and savannas of wild grass are mingled.

CHRISTIAN SCIENCE.—The following interesting reply was returned to a circular letter soliciting subscriptions to a certain medical journal:

FARIBAULT, MINN., Feb. 22, 1894.

Your copy of the —— Jurnal come, and the letter to—askin me to send fifty cens and git it fur a yeer, I don't need no jurnals. When I git a tuff case I go off inter sum secrit plase and tell the lord all about it and wate for him to put inter my minde what tor do. Thats bettern jurnals and syklopeds and such. If we hed more lord trastin docters and less colleges weed fare better. The lord noes morn all the doctors and if we go te him fur noledge it ill be bettern jurnals.

Fraternally in the lord.

A CARISTUM DOCTER.

—*Pacific Drug Review.*

AMERICAN PUBLIC HEALTH ASSOCIATION.

Abstract of the Proceedings and Papers of the Twenty-second Annual Meeting, held at Montreal, Canada, September 25th–28th, 1894.—Continued from page 535, Vol. XXXIII.

THE SECOND day's proceedings opened with a large accession to the membership of the Association, the announcement of the Advisory Council, and announcements by the Chairman of the Committee of Local Arrangements.

DR. JOHN T. NAGLE, Registrar of Vital Statistics, New York City, submitted printed reports as prepared by DR. CYRUS EDSON, Health Commissioner of that city. Also a circular of information to physicians regarding the measures adopted by the Board of Health of New York for the prevention of tuberculosis, and a paper in the form of a report on the *antitoxin treatment of diphtheria*, comprising the following annotations:

1. In diphtheria, death, as a rule, is due to the poisoning by a chemic substance (a toxin) produced by the diphtheria bacillus in the throat and absorbed.

2. A certain degree of immunity, which is temporary only, is afforded by one attack of diphtheria, and this immunity is the result of an acquired tolerance to the "toxin." This applies to both animals and man.

3. If large animals are inoculated from derived cultures of the diphtheria bacillus they become gradually tolerant to its poisonous action.

4. This immunity is the result of the development in the blood of antitoxin.

When animals have thus been immunized, blood is withdrawn from the circulation in quantities varying with the size of the animal, and then employed through hypodermatic injections in the treatment of cases of diphtheria, and the antitoxin thus introduced neutralizes the toxin absorbed into the circulation of the sick person. By this method it is apparently possible to protect persons from diphtheria when they have been exposed and infected, if the general symptoms have

not yet appeared, and also to cure them, as a rule, when treated in the early stages of the disease.

A brief discussion ensued on the papers on diphtheria read on the previous day, as well as upon the report of DR. NAGLE, which was participated in by DRS. FERGUSON, of New York; HINGSTON, of Montreal, and FORMENTO, of New Orleans.

DR. E. GAUVRAU, Director of the Vaccine Institute of Ste-Froye, P. Q., contributed a paper on "*Culture and Collection of Vaccine Lymph.*"

RESTRICTION AND PREVENTION OF TUBERCULOSIS was the subject of a paper by DR. N. E. WORDIN, member of the State Board of Health of Connecticut. He took the ground that since the wonderful strides made by the science of bacteriology, the germs of diseases are no longer unknown, unseen but dreaded organisms, but are things that we can see, handle, and kill. The bacillus of consumption is fortunately one which science has many advantages in combating. It takes weeks and months to develop, and requires a special temperature and moisture to develop. Practically the only means of communicating the disease is through the sputum. There is little danger from the bacillus so long as it is moist. But there are some ways in which it may be directly transmitted, as by kissing. Among the hygienic commandments for consumptives and syphilitics there should be one, "Thou shalt not kiss." Direct inoculation may occur through coughing, by soiled hands and clothes; but the cases thus transmitted must be very few. The only danger worth considering is from the sputum after it has been dried. The solution, then, of the whole question resolves itself into this, that in order to prevent the spread of this terrible disease, it is necessary to destroy the sputum as soon as it is emitted from the person, as soon as it has become dried. The difficult thing is to get it before it has escaped into the air and become dried. Tuberculosis should be put on the list of infectious or communicable diseases to be reported to the Health Officer. Following this there should be a thorough disinfection of all houses in which tuberculosis has occurred. In the second place there should be compulsory disinfection of hotel rooms, sleeping-car berths, steamer cabins, and prison cells which have been occupied by consumptives before any other

persons are allowed to occupy them. In the third place there should be special hospitals for the treatment and prevention of tuberculosis. No tuberculous female should nurse a child; milk from a tuberculous animal should never be used, an overcrowding in houses should be prevented. Michigan has taken the advance in requirements of notification and restriction of this disease. She has already reaped an abundant reward. In 1878 the cases of consumption were .71, and this proportion has steadily decreased every year, until in 1889 it was .49, which goes to show that an ounce of prevention is worth tons of cure in the restriction and prevention of this "great white plague," which claims its victims from those in the flush and bloom of youth, from the ranks of the fairest and best in the land.

DR. F. O. DONOHUE, President of the State Board of Health of New York, read a paper on "*Examination of the Milk Supply for Tuberculosis in the State of New York*," published in full in preceding number.

DR. PAUL PAQUIN, member of the State Board of Health of Missouri, read a paper on "*Should the Marriage of Consumptives be Discouraged*," which he strongly urged, basing his argument on heredity. Children of consumptive parents are born feeble and predisposed to the disease. The marriage of consumptives, he said, establishes a pest-house, and children's rights are hazarded. They should be born healthy, and not condemned to die young. It was a cruel system which put children in the world handicapped at the very start of the battle of life by feeble health. Marriages which would obviously result disastrously to the human race by producing weakly children should be prevented, and science should protest against the marriage of consumptives by judicious regulations.

THE CLIMATIC SEGREGATION OF CONSUMPTIVES, by DR. HENRY SEWELL, Secretary of the State Board of Health of Colorado, was an urgent demonstration of the special advantages of Colorado as a resort for consumptives. He contrasted the superiority of that State with the so-called arid regions of the United States, exclusive of Alaska, which forms about one third of the country and includes parts of the States and Territories of California, Oregon, Wyoming, Washington,

Idaho, Utah, Arizona, Nevada, and New Mexico, and outlined a reasonable method for the frequent cure, the inevitable prevention, and perhaps the final suppression of consumption. He said in part: The most certain and speedy blotting out of the disease would follow the instant and permanent isolation in some far-off region of every individual afflicted with it; but mankind will choose to go on in suffering rather than shock its ethical nature in forcing such seclusion. Undoubtedly our main defence when the disease exists depends upon the growth of broad and sound views of sanitary facts among the people; not merely the lip knowledge which repeats words, but the active realization of the burnt child who dreads the fire. It is a pity that those modern educators who have induced State Legislatures to dictate that the evils which may follow the use of tobacco and alcohol shall be described in the school physiologies, should not have seen to it that the youthful mind might have demonstrated to it the nature and causes of infectious diseases and the modes of combating them. The author believes that an appropriate course of bacteriology would be a fascinating, comprehensible, and infinitely practical addition to the curriculum of the secondary schools.

In the experience of the past it is not a bold assertion that consumption is incurable by any known drug, and that the single hope the consumptive has is to improve the vital resistance of his own body. Moreover, it may be taken as established, that the one essential factor, more important than all others combined, in this improvement of militant vitality depends upon out-door life with its incidents of fresh, circulating air and sunshine. Observation shows clearly enough that the place of residence of the consumptive is not indifferent; that, in general, it is better for him to change his abode from the place where the disease was contracted; that inland excel sea-shore resorts; that dry air is more beneficial than moist; that altitude above sea-level is of decided advantage, and, above all, that purity of air and absence of micro-organisms and the matters incident to their existence from it are indispensable conditions for the improvement of the sick one.

Numbers of suitable places at once occur to any one who is familiar with Colorado; I may definitely specify the neigh-

borhood of Colorado Springs, several localities within a few miles of Denver, Perry Park, half-way between the two places, points to the north of Denver and Estes Park. Certain of these places are habitable all the year around, and others best available only in summer. A salaried resident physician should be constantly on the ground for the moral comfort and physical demands of the patient. There would be no objection to these communities increasing to the size of villages of 300 or even 500 inhabitants, there being but one single essential proviso—*i.e.*, that all things and acts therein accomplished shall have reference to the benefit of the invalid and the restriction in the spread of disease. The essential sanitary laws are few, broad and accepted by all, and physicians at large might send to such an institution their private patients and still keep them under observation. The cottages should be constructed with sole reference to their uses, and might each accommodate from four to eight persons. An important part of the scheme would consist of a central building with rooms above for the accommodation of the weaker invalids and with an assembly room and various dining-rooms below. Patients who could afford it might be allowed to occupy a whole cottage and cater to a private table. The food for all should be of the best.

The land appropriated to the sanatorium should be extensive; not less than five or ten acres to the cottage, and it should be an object to raise, under proper restrictions, vegetables for the table, and to keep a special herd of milch cows. No efforts should be spared to provide outdoor amusements, scientific and trivial, of every suitable description. Such sanatoria are by no means intended as permanent abodes. The invalid should be turned loose to provide for himself as soon as safely able, to earn his own livelihood, and after he has acquired that simple but precious education through which he learns the habits that protect himself and others from the disease. For most favorable cases this time would average from three to six months, and includes that critical period when the homesick, helpless sick one drifts, a stranger, into the hotels and boarding-houses of Denver or Colorado Springs, and often, because of his surroundings, receives a fatal impulse which determines his dissolution. I say no word

of absolute *cure*. Undoubtedly cases occur in which, after a few months' residence under favorable conditions, the invalid may return, restored to health, to the scenes and occupations of his downfall. But I know no means of ascertaining whether such a cure has been attained, and the humiliating, fatal mistakes made by most skilful medical observers who have let their good will direct their good sense form a patent warning against such a course. There is, however, a cure which can almost be guaranteed—that this disease may be so arrested as to interfere in no wise with the usefulness or enjoyment of life lived under the conditions establishing recovery. This, then, is at least one great advantage that Colorado possesses over health resorts of the East—that means of earning a livelihood and the chief requisites of a happy existence are to be found almost at the doors of the sanatorium.

Discussion followed. DR. NAGLE, of New York, explained that in that city the sputum of all patients suspected of having tuberculosis is microscopically examined, and in the event of death or of removal the apartments occupied are disinfected, and friends of patients are furnished with simple but complete instructions for the care of the patients. One of the instructions is that the clothing of tuberculous patients should not be allowed to go to the laundry with the clothing of healthy persons. DR. FERGUSON, of the laboratory of the New York Board of Health, explained that investigations showed that both consumption and diphtheria bacilli lie in wait on the shining glassware of the most aristocratic drinking glass, in the artistic combs, brushes, and razors of the highest class of barber shops, and in the communion cup. Bacilli from all of these articles, he said, had been procured. In the case of the communion cup, he believed that the germs of consumption could be transferred from lip to lip with disastrous results. Continuing, he said the sputum of animals and men were the same, and that twenty-nine different forms of bacilli had been found in the sputum of man. DR. LEE, of Pennsylvania, expressed the belief that all State and provincial boards of health should have bureaus to supply the public with information as to the dangers of consumption. He also objected to the philosophy of DR. PAQUIN'S paper on restricting marriage by legal interference with the rules of natural

selection. This, the speaker stated, should be avoided. DR. D. C. RAMSEY, of Mt. Vernon, Ind., feared that the clinical thermometers of physicians were often the cause of conveying infection. Physicians should always have these in a perfectly aseptic condition. DR. PAQUIN replied to DR. LEE by explaining that he did not say a word in his address regarding legislative interference in this matter, simply to educate the public on the dangers of the continuance of the present system of marriage among consumptives.

QUARANTINE APPLIANCES.—At the evening session, DR. FREDERICK MONTIZAMBERT, General Superintendent of the Canadian Quarantines, gave a lucid description of the St. Lawrence quarantine plant at Grosse Island.

The subject was illustrated by lantern slides. General view of the quarantine station in the St. Lawrence River, thirty miles below Quebec; a profile view of the island, showing detention buildings, hospital, etc.; view of the hospital (100 beds); same building from another view; disinfection room in hospital; ambulance to go to wharf; view of central part of station; view of same building and doctors' quarters; eastern part of central division and disinfection building; same building for first-class passengers; steam disinfecting building; front of three boilers of forty horse power each; one of the chambers open; a chamber with railroad track standing in it; a telemometer with figures on dial, etc.; one of the dials of the telemometer greatly enlarged; a small detention building for steerage passengers; inside of a shed for use of steerage passengers; a view of a spot of historical interest when, during the famine in Ireland in 1847, Irish immigrants died of typhus-fever and were buried there; closer view of same, and monument erected in memory of the medical officers who contracted the disease while administering to those that fled from pestilence and famine in Ireland, who also succumbed to the disease. In all, 5424 persons found a grave in America at that place during the latter part of May, June, July, August of that year; a view of one of the quarantine disinfecting steamers; a view of one of these steamers alongside of a ship; the other disinfecting steamer, the *Challenger*, which has a ship's cabin only, and carries all the appliances to disinfect a steamship; two of the men with jars con-

taining mercuric chloride solutions, proper steam dredge and pipes, etc. ; same view reversed, also to show in the distance where the work of disinfection is done.

The methods of steam sterilization were especially dwelt upon, in addition to which DR. MONTIZAMBERT stated : " It may be within the recollection of some of my hearers that last summer remarks were made in some of the papers about a party of Poles who were stated to have evaded quarantine inspection and disinfection at Quebec. Now, it is impossible for immigrants to avoid or evade the quarantine inspection, because no immigrants arrive by the St. Lawrence except in a ship, and no ship from outside Canada can make customs entry at the port of Quebec or Montreal without exhibiting, as the very first paper called for, the certificate of its inspection at and discharge from quarantine. This is under a penalty of the Collector of Customs or customs officer, of $400 and imprisonment for six months for allowing customs entry of any vessel in the absence of the production of a quarantine clearance in accordance with the requirements of the regulations. And this is not simply an enactment hidden away in the printed regulations, and unknown to those who have not occasion to study them, but it is quoted in full upon the face of every quarantine clearance, so that it is being kept continuously under the notice of the pilots, captains and customs officials. Furthermore, in the case of all passenger vessels, the clearance granted by the quarantine officer is conditional on the landing of immigrants and their luggage at the disinfection substations at Quebec and Levis at the deep-water termini of the railways. The supervising officer of such disinfection has to count the immigrants as they land, and if he finds the number tallies with that marked on the clearance of the quarantine officer (the whole number on board, or those from infected countries as at present), and has satisfactory evidence that all their luggage has been landed with them, he shall punch the clearance at the place marked for that purpose, which shall then alone become valid for customs entry.

" So you see evasion is impossible on account of the safeguards with which the Dominion Government has surrounded the processes of inspection and disinfection. Intentional removal of evidence of disinfection we cannot guard against.

It was thus with those Poles to whom I referred, who were found at Toronto without their luggage, bearing evidence of disinfection. They had been inspected at quarantine, and their luggage had been sterilized and tagged at Quebec. There was the interval from Tuesday morning at seven, to the Sunday following between their leaving Quebec and their being found at Toronto. During this time they are stated to have undertaken work at Cornwall, and from thence to have been taken on by a 'boss' to work in the States. This being so, they would naturally remove all possible traces of recent arrival, so as to evade the alien contract labor law at the frontier. We inspect, we disinfect, we tag, we warn immigrants to preserve the evidences of disinfection, and we provide against accidental loss of these by the use of a stamped seal and almost unbreakable wire attachment; but we cannot prevent the intentional removal of the tags once the luggage has been claimed by its owner and removed." DR. MONTIZAMBERT referred to the wish that he, like other sanitarians, entertained, that the word quarantine could be dispensed with. It was founded on an idea which science had outgrown, and its retention caused modern methods to inherit, undeservedly, the objections rightly urged against the old. The key-note of the old system was prolonged detention; that of the modern system was prompt disinfection.

In conclusion, DR. MONTIZAMBERT reminded his hearers that there must always be the possibility of exotic disease passing the quarantine barriers in an invisible and unrecognizable stage and condition, and first declaring itself in the interior of the country. This could not be entirely avoided without such routine detention and disinfection of all vessels, passengers, and merchandise at the ports of arrival, and such consequent interference with trade and commerce, as would be quite unjustifiable and impracticable. "Quarantines," he said, "may be held accountable for dealing with actual cases of infectious diseases, with infected vessels and effects, and those suspected of being infected, but they must not be expected to do the impossible, nor should they be leaned upon as an excuse for lessened effort inland. Coast quarantines and inland health organizations must form our double line of defence, or, to borrow an illustration from the game of cricket,

the coast quarantine is the wicket-keeper and the health board the long-stop. But the well-equipped and well-worked quarantine can and should strain out and protect the country from a very large percentage indeed of the exotic diseases which threaten it from time to time, and so do a great and very valuable work. I think that from what you have heard and seen this evening you will agree with me that the Dominion Government has placed the quarantine service of the St. Lawrence in a condition thoroughly to perform its onerous and important duties, and to be an actual and potent protection to this country. And as the people of Canada and the United States become more generally acquainted with the manner in which work is really done at our ports, and the safeguards the Government has provided to prevent the evasion of quarantine inspection and disinfection, there will be an ever-increasing confidence in the quarantine service and leave less and less unnecessary uneasiness and fear for themselves."

SOME POINTS IN THE HYGIENE OF THE YOUNG IN SCHOOLS was the subject of the next paper, read by DR. J. CHALMERS CAMERON, Professor of Obstetrics and Diseases of Children, McGill University, Montreal. The paper was a distinct arraignment of school boards for neglecting to provide hygienic appliances. Some thirty years ago it was remarked by Mr. Herbert Spencer that the first requisite of success in life is to be a good animal, and that to be a nation of good animals is the first condition to national prosperity. As the nation is an aggregation of individuals, the history of the nation is in a certain sense the history of its individual merits. Its strength, progress and development depended upon the strength, progress, and development of its members; therefore, other things being equal, that nation will be most prosperous which secures the highest development for its members. From the age of four or five up to fifteen or sixteen, the period of active growth and development, most children are at school, being educated and trained for their life work. If the schools fulfil their important functions well and turn out their scholars good animals, well equipped for the battle of life, the first condition of national prosperity will have been attained; but in whatever degree they fail to secure the best results, in the same degree will they hinder national progress.

It seems, therefore, peculiarly fitting that the American Public Health Association should examine carefully the methods of the public schools and inquire whether the best possible is being done, and whether sufficient attention is being paid to the all-important matter of hygiene. However we may theorize as to the nature of man, we can at least distinguish two essential parts, mind and body; and however we may speculate as to their essence and mode of union, we know at least that all life long they are linked together for weal or for woe—they develop together, mature together, decay together, ever dependent upon each other, reacting upon each other, sympathizing with each other, suffering with each other. When we strengthen the body we invigorate the mind; when we starve and neglect the body we starve and enfeeble the mind. It follows, therefore, that for the proper development of the individual, the body must be considered and cared for, as well as the mind. According to Nature's plan, body and mind develop simultaneously, not alternately. While bone and muscle, nerve and gland are growing and specializing, the child is busy observing, testing, comparing, gaining a knowledge of his environment and learning to reason and think. So the process goes on, but by and by the child is sent to school. Is the same plan of development continued? Do our school boards realize that education should look to the physical as well as the mental needs of their scholars, and that strong bodies are as essential to success in life as well-stored minds?

When we look at the curriculum of our schools we find no lack of studies; perhaps the courses are too extensive, and too much is being attempted. We find that the scholars are carefully graded and arranged in various forms and classes; that their work is thoroughly systematized and that they are taught and examined *secundum artem*. All are cared for; none are overlooked. But in how many schools is adequate attention paid to the physique of the scholars? In how many is their physical condition examined and studied? Before they are promoted to a higher form they must obtain a certain percentage of marks in their examination, and demonstrate their ability to undertake more advanced work. But is there ever a question as to their physical ability for the new

work? At the end of the year they are examined to determine their scholastic proficiency. Is there ever a question as to how the body has fared meanwhile? Some schools have playgrounds and give a recess presumably for play, but play is optional—the children may play or not as they please—there is no grading, no direction or supervision. Some schools have a gymnasium, but in how many is there a competent instructor to examine the scholars and grade or supervise their work? What sort of progress would there be in a school if the scholars were allowed to choose whatever studies they pleased, go into whatever classes they pleased, and study or not as they pleased? And in like manner what sort of bodily development can be expected when the arrangements for physical training are so crude and unsatisfactory? In respect to physical culture our educational system is sadly deficient. Childhood is the time to detect and prevent such deformities as spinal curvature and pelvic deformity.

Not only should children be taught in school how to stand, sit and walk, but more important still, they should be taught how to breathe. In the larger cities a valuable addition to the educational staff would be an inspector of physical culture. School desks are responsible for a good deal of deformity. The desks and seats are of uniform height, while the pupils are of various sizes. If too tall the children must stoop; if too short they must reach up somehow. No matter whether the spine is curved or the shoulder raised, the chest is compressed. Could not there be, asked the doctor, some simple arrangement of raising and lowering the desks and seats like a piano stool? The doctor considered the bar-bell exercise as most generally applicable to school work. Physical exercise in schools should aim to cultivate the habit of sitting, standing, walking and breathing properly. A child that sits improperly is apt to stand and walk improperly. If the bad habit is not corrected more or less permanent spinal curvature is apt to result.

Much has been done in investigating the causes of disease and preventing the spread of infection. Can we not go a step further and develop in children strong bodies which will resist the inroads of disease? Bacteriology has taught us that many diseases are directly traceable to the action of microbes intro-

duced into the body from without. The seed, the infective microbe, is one factor; the suitable soil, the debilitated body, is the other factor. Dazzled by the brilliant discoveries of bacteriology, have we not overlooked somewhat the necessity of rendering the soil unsuitable for the growth of the seed by developing the existing powers of the human body? If we attack the problem from both sides, its solution will be easier and more satisfactory. We live in an age of restless activity; now, more than ever, is there need for strong physical frames to bear up in the ever-increasing struggle of life. Now, more than ever, are men and women breaking down in middle life, their usefulness cut short when they have become most valuable to society and the State. Now, more than ever, is the battle to the strong, and staying power is essential.

MR. JOHN MITCHELL, President of the National Association of Master Plumbers, New York, read a paper on PLUMBING AND SANITATION. He recommended that annual or semi-annual inspection of old buildings be made. A plea was made for the support of the Association in procuring certain legislation desired by the plumbers of the United States. He pointed out the close relation between honest plumbing and sanitation, and closed by suggesting the passing of a resolution urging the members to exert themselves for the enactment of a law that "pure air and pure water shall abound in every home."

DR. ARTHUR R. REYNOLDS, Commissioner of Health, Chicago, said, in accordance with the suggestion of the reader of the paper, he desired to offer the following resolution:

Resolved, That the American Public Health Association, in convention assembled, approve and recommend the enactment of sanitary plumbing and drainage laws in the future construction of our buildings for the better protection of the health of our people.

Under the rules, this was referred to the Executive Committee without debate.

DR. T. D. CROTHERS, Superintendent Walnut Lodge Hospital, Hartford, Conn., read a paper on THE INFLUENCE OF INEBRIETY ON THE PUBLIC HEALTH. Among other things he said: "The contagion of saloons is like an infection. Inebriates and saloon-keepers were the prominent factors in

the recent riots of our country. For two thousand years this subject has been studied, accepted and denied. A summary of these conclusions is given here. Inebriates in the pauper class should be under legal restraint, as they are dependents and are parasites. They could be organized into self-supporting colonies and producers. They should have medical care and be under military restraint. There are 500,000 of this class in this country. What an army! Their conduct should be studied from a physical standpoint. Moderate drinkers were included with those who were a standing menace to public health." Drunkenness he considered as much a subject for isolation and quarantine as persons afflicted with the cholera or small-pox.

DR. GIHON inquired of the essayist if he intended to classify inebriates and moderate drinkers and occasional drinkers all within one category. If so, he thought that the paper was better suited for a temperance society than for this Association.

DR. CROTHERS replied that occasional drinkers are periodic and spasmodic drinkers, while moderate drinkers are those who imbibe five or six times daily.

CORRECTION.—The "Cart-before-the-Horse" *not* in New Haven. In "his city," in the following paragraph from *Proceedings of the American Public Health Association*, in our December number, should have been in a city of Connecticut:

"DR. C. A. LINDSLEY, of New Haven, Conn., cited a case of failure of 'the cart-before-the-horse' plan, as follows: In his city a law was passed by the Common Council to appoint a 'plumbing inspector' to be approved by the State Board of Health. A gentleman was selected for this position and then presented himself before the State Board for examination. He failed to pass the necessary requirements, and the Board so reported to the Mayor and Council. The man was, nevertheless, appointed to the position without the indorsement of the State Board."

We are happy to know that the Plumbing Inspector of New Haven is an accomplished "Horse" in his proper place, and that *his* pull is with the sanitary authorities.

(*To be continued.*)

SAND FILTRATION OF WATER, WITH SPECIAL REFERENCE TO RECENT RESULTS OBTAINED AT LAWRENCE, MASS.

READ AT THE MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION AT MONTREAL, CAN., SEPTEMBER 25TH, 1894.

By CHARLES W. FULLER, Biologist in charge of the Lawrence Experiment Station of the State Board of Health of Massachusetts.

WITH the increase in our knowledge of epidemiology, and the causation of certain diseases, it has become clearer than ever before that more careful attention must be given to the quality of water supplies. It is true that drinking-water is not the source of all deaths from diseases, the germs of which are known at times to be water-borne. Certain weight must be given to infected milk and other foods, to deficient drainage and sewerage, to neglect of laws of personal hygiene, and to other sources. Owing to the general absence of the results of sanitary analyses and of sanitary inspection, it is impossible to state at present how important is the part played in the transmission of diseases by each of these sources. In the case of water, however, it is positively known that its part in the causation of certain diseases is a prominent one; authorities differ only as to the degree of its prominence.

Sanitarians clearly realize that opportunities for supplying large communities with pure drinking-water from ground-water sources, or from surface waters taken from uninhabited watersheds, are becoming fewer and fewer. They recognize, furthermore, that the time has fully arrived when strenuous efforts must be made in the interests of the public health to afford practicable and reliable means for freeing infected water supplies from disease-producing germs.

Bacteriology teaches us that water may be sterilized in three ways—by means of chemicals, by means of heat, and by means of filtration. While chemicals have been of much aid in surgery by bringing about antisepsis and asepsis, it is very

improbable that people would allow their drinking-water to be drugged with chemicals, even with the view to removing dangerous bacteria. Indeed, such a method might prove very dangerous in many cases. Heat is a much safer means of sterilization, and its application in the household has doubtless done much good. But on the ground of practicability and economy, as well as of reliability, in the light of our present knowledge, each of these methods of sterilization for the removal of disease-producing germs from water supplies drops into relative insignificance when compared with filtration.

At the annual meeting of this Association at Chicago last year I had the honor of presenting to you some of the results of the investigations upon water purification made by the State Board of Health of Massachusetts. It was then shown that all disease-producing bacteria in the Merrimac River at Lawrence may be removed by slow intermittent filtration through fine sand and loam. But this is not all that the filter accomplished in the removal of bacteria. Out of 102 analyses, 58 indicated that the filtered water was absolutely sterile. Furthermore, the few bacteria which were found in the effluent from time to time belonged to the most hardy species of water bacteria, many of which existed in the form of spores and which, let it be understood, are not killed by the ordinary application of heat or of chemicals.

Spring water obtained from favorable sources has repeatedly been found to be absolutely sterile. This is the result of natural filtration. This is nature's method of purifying water, and the efficiency of natural filtration may be attributed to the retention of the bacteria within the filter under an unfavorable environment. The natural consequence of these unfavorable conditions is the survival of the fittest bacteria. Now the evidence at hand shows that the disease-producing bacteria are among the first to succumb, because farthest removed from their natural habitat. The non-pathogenic bacteria eventually perish also, but unlike the case with the dangerous species, this does not happen until they have established a home and breeding-place within the filter. Under the most favorable conditions, filtration may be conducted so that no bacteria pass through with the filtered water. This can only be done under circumstances where the discharge from the

filter is sufficiently removed, by time and distance, from the main seat of bacterial activity.

We know that there are a score or more of germs which may produce specific diseases in mankind. There are many more species which are of the utmost benefit to the human race. They accomplish their work by decomposing and nitrifying processes, and convert objectionable organic matter and disease germs to harmless mineral matter. The benefit to mankind of the saprophytic bacteria cannot be overestimated. In this connection it is instructive to quote the conclusion from Pasteur's admirable investigations: "Whenever and wherever there is decomposition of organic matter, whether it be the case of an herb or an oak, of a worm or a whale, the work is exclusively done by infinitely small organisms. They are the important, almost the only, agents of universal hygiene; they clear away more quickly than the dogs of Constantinople or the wild beasts of the desert the remains of all that has had life; they protect the living from the dead. They do more; if there are still living beings, if, since the hundreds of centuries the world has been inhabited, life continues, it is to them we owe it."

In no place in nature are the opportunities for this bacterial activity more favorable than in filters. We find that the purification of water with the removal of disease-producing germs by filtration is nature's method. We may go a step farther and state that in the purification of water that method is safest which follows most closely nature's method, and which is least dependent on human agencies.

Nature's method of filtration means the intermittent application of water to sand or soil in rates equal to the rainfall. The economic adoption of sand filtration, particularly as it has been practised successfully for many decades in Europe, differs from nature's method, strictly speaking, in that the rate of filtration is much higher and the surface of the sand or soil is covered with water for long periods of time. The essential underlying principles, however, are the same, because the results are produced by bacterial activity which permanently exists in all filtering materials.

While the removal of pathogenic bacteria by chemicals, including coagulants, and by heat, will forever be directly de-

pendent on human attention and judgment, I venture to predict that the day will come when the knowledge of filtration among sanitary scientists will be such that filters may be constructed and operated by which water, free from objectional bacteria, will be supplied to hundreds of thousands of citizens and require the attention of a mere handful of men.

Even under these circumstances the opportunity for exercising personal attention and judgment can be reduced to very narrow limits. In order to obtain this desirable end it is necessary to study thoroughly the laws of filtration from engineering, bacteriological, chemical, and hygienic points of view.

For the past seven years the State Board of Health of Massachusetts has been studying the laws of filtration at the Lawrence Experiment Station. In a certain sense the Lawrence work may be regarded as investigations upon nature's ways of working, with a view to their more economical and advantageous application to the problems in actual practice. The results of these investigations have been published from time to time in the annual reports of the Board. It is fitting on this occasion that I review some of the more important points upon the filtration of water in the annual report of the Board for the year 1893, which is just issuing from the press.

In the operation of a filter one of the important points is the rate at which the water passes through the filtering material. As a result of European experience the conventional limit has been set at from 2,000,000 to 3,000,000 gallons per acre daily. Recent results obtained at Lawrence show that the Merrimac River water may be filtered through proper materials at rates of 4,000,000, 6,000,000, and even 8,000,000 gallons per acre daily, with practically no diminution in the bacterial efficiency. Further investigations are necessary to show whether filters may work at these rates for an indefinite time without a period of absolute rest. The maximum rate of filtration allowable depends upon the quality of the water and the quality and quantity of the sand. The advantage of higher rates of filtration with undiminished hygienic efficiency is apparent because it means reduced size and cost of the filtering plant.

It is well worth noting that in the operation of water filters

a greater hygienic efficiency is obtained from uniform than from fluctuating rates of filtration. The disadvantage of fluctuating rates has been demonstrated in the case of some of the older water filters in Europe. From the Lawrence work it appears that with filtering materials of increasing degrees of coarseness and with higher rates of filtration the advantage of uniform rates becomes more marked.

Concerning the depth of material it has been found that while very satisfactory results may be obtained under favorable conditions from filters one to two feet deep, the deeper five-foot filters are safer.

The investigations indicate that, within the limits in sizes of sand grains which would be usually employed in filtration, the finer sands are, ordinarily, slightly more efficient in removing bacteria than the coarser ones.

It has been stated that an objection to sand filtration of water is that the hygienic efficiency is materially reduced during the period which immediately follows the scraping of the surface of filters to relieve clogging. In the light of recent Lawrence results this period of somewhat diminished efficiency appears to be due in part to mechanical disturbance of the main body of the filtering material during the process of refilling the filter with water after draining and scraping it. The effect of this mechanical disturbance, caused largely by extrusion of air, is to create places of lessened resistance to the passage of water through the filter, thereby allowing the water to pass through certain limited areas of the material at very high rates and under abnormal conditions of filtration.

It has been found that there are reliable and practicable means of overcoming this difficulty; one method, for instance, is by slowly filling the filter from below after draining.

In regard to the application of water to filters, there are two methods; first, the continuous method by which the filters are continuously operated with the surface of the sand constantly covered with water; and second, the intermittent method by which, from time to time, the water is shut off from the surface for a certain period and the water allowed to drain out of the sand, the pores of which fill with air. The advantage of intermittency is that it provides, within the

filtering material, an additional amount of oxygen, with which the bacteria may perform their functions.

So far as the experimental filtration of the Merrimac River water at Lawrence is concerned, there is no marked difference in the average results which may be obtained by the two methods of application of water. The reason of this is that a practically sufficient quantity of free oxygen is held in the water as it flows on to the filters. In 1890 it was shown that a small amount of oxygen (1 to 3 per cent) in the air of a sewage filter was effective, provided that the air was changed so often that some oxygen was always present at every point. That continuous filters at Lawrence are supplied, under ordinary circumstances, with sufficient oxygen is shown by the fact that it has never been found absent in the effluents as they flow from the filters through trapped outlets. This is confirmed by the results of long series of analyses of the effluents from both continuous and intermittent filters. Moreover, the analyses of the filtering materials themselves showed that the sand from intermittent filters contained substantially the same amount of organic matter as that from corresponding continuous filters.

To make clearer the interpretation of the investigations upon this point, let me state that the free dissolved oxygen in a water depends chiefly upon temperature and pressure. As there is practically no increased pressure upon water as it flows on to filters, the amount of free oxygen held in the water varies with the temperature, and, generally speaking, cannot exceed the point of saturation for the given temperature, even after aeration. The maximum quantity of free oxygen held in water varies from 1.47 parts at 32° F. to 0.81 part at 80° F., expressed by weight in parts per 100,000. Now it will be seen that the quantity of free oxygen, which is absolutely essential to chemical and bacterial purification of water by sand filtration, cannot exceed a fixed quantity in different waters under parallel conditions of pressure and temperature ; while the amount of organic matter in waters under the same conditions may increase within wide limits. The quantity of free oxygen within the filter, which will suffice for the complete purification of the water, must be in proportions corresponding to the organic matter. For this reason

it is clear that spring waters and other waters which contain relatively small proportions of organic matter can be filtered by the ordinary continuous method with complete success, while the filtration by this method of sewage, which contain a comparatively large quantity of organic matter, is an absolute failure. Intermediate between the two, in point of organic matter, a line must be drawn, below which either the continuous or the intermittent method of application of water to filters is allowable, but above which the intermittent method can alone be used with safety. Not only the quantity, but also the quality, of the organic matter must be taken into consideration, for it is well known that animal matter is more easily decomposed and mineralized than organic matter of vegetable origin.

With regard to the experience at Lawrence, it may be stated that during midsummer, the period of greatest bacterial activity within the filters, and also the time when the amount of free oxygen in the Merrimac River water is least, intermittent filters give somewhat better results. On the other hand, during midwinter, when the Merrimac River water is saturated with oxygen, the advantage appears to lie somewhat in favor of the continuous filters, because they are more protected from the effect of freezing weather.

In order to obtain the required amount of free oxygen, it is probably necessary in the case of some waters, and is absolutely essential in the case of sewage, to charge the pores of the filter with oxygen from time to time, because the quantity which can be applied in the water is limited by the point of saturation. Therefore the arbitrary adoption of the continuous or intermittent method of application in the filtration of a certain water is not advisable; it becomes a matter of adjustment of the necessary quantity of free oxygen within the filter to the amount and quality of the organic matter in the water under consideration.

We have now considered the way in which sand filtration does its work, and referred to some of the controlling factors in its operation. Let us next turn to the hygienic results obtained by filtration and to their interpretation.

At the Lawrence Experiment Station, during the year 1893, there were made more than 12,000 bacteriological analyses in

repeatedly testing the efficiency of twenty individual filters of different construction and operation. The average results of these analyses indicated that 98.46 per cent of the number of bacteria in the Merrimac River water were removed by filtration. This average includes all normal results, many of which were obtained from filters and under conditions which would not be recommended for adoption in practice. Under reasonably favorable conditions, the removal was from 99 to 99.5 per cent of the number in the applied water. Of the average percentage (1.54) of bacteria which remained in the filtered water, in actual numbers 140 as compared with 9100 in the river water, a majority appear to belong to the most hardy forms of water bacteria. Furthermore, it has been learned that from 15 to 25 per cent of these bacteria are present in the form of spores, which, as has been stated above, are not killed by the ordinary application of heat and of chemicals.

In studying the hygienic efficiency we are not dependent alone on the results from these water species of bacteria. Billions of typhoid-fever germs, *B. coli communis* and *B. prodigiosus*, a species which is similar in its mode of life in Merrimac River water to *B. typhi abdominalis*, have been cultivated and applied to the filters. When these germs were put on to the filters in numbers corresponding to the water bacteria, under high rates of filtration, they passed through the filter into the effluent in very limited numbers. They were present in the filtered water, however, in relatively much smaller numbers than the common water bacteria. Under parallel conditions, the ratio of *B. prodigiosus* to common water bacteria in the effluents appears to range between 1 to 10 and 1 to 5. The average number of these germs, applied in pure culture to the filters, was 6000 per cubic centimeter, of which 99.81 per cent were removed by the filters.

The reason why such large numbers of these specific bacteria were applied to the filters was to test the efficiency of filtration under different conditions, and to obtain numbers sufficiently great to show clearly the laws of filtration. It will be admitted by every one that the tests upon the efficiency of the filters in removing these bacteria were far more severe than would ever occur in practice. Looking at the experi-

ments more carefully it is seen that these germs were applied to the filters for weeks, in numbers equal to those of the ordinary bacteria in the Merrimac River at Lawrence. At times, in fact, the numbers were a hundred-fold greater. In order to appreciate more fully these experimental conditions, let me state that in order to obtain, in actual practice, corresponding numbers of typhoid-fever germs, it would be necessary to add to the drainage area of the Merrimac River, above Lawrence, a population sick with typhoid-fever and equal in number to the present inhabitants. This statement assumes, of course, that there would be conditions corresponding to the present ones with regard to sedimentation, the effect of light, temperature, osmosis, etc. It may be safely stated that the experimental conditions at Lawrence are a hundred-fold more severe than would ever occur in the filtration of an ordinary water supply. This shows what a large factor of safety lies behind the bacteriological investigations at the Lawrence Experiment Station, and furthermore may serve to explain the confidence with which those who are familiar with these investigations believe in the hygienic efficiency of sand filtration of water supplies.

The results from the filtration of water at Lawrence are no longer confined to the experimental stage. A filter to purify the water supply of the city of Lawrence has been for the past year in successful operation. From an engineering point of view this filter contains many important features which are described in the forthcoming report by its designer, Mr. Hiram F. Mills, Chairman of the Committee of the State Board of Health upon Water Supply and Sewerage.

Briefly, it is 2.5 acres in area and contains sand of an average depth of about 4.5 feet. The depth of sand varies from 3 to 5 feet, but owing to the arrangement of the underdrains all water passes through at least 5 feet of filtering material. The filter is situated by the side of the Merrimac River and separated from it by an embankment. Its surface is 2 feet below low water in the river. The water is allowed to flow on to the filter about 16 hours a day on an average, and during the remainder of the time the sand is drained and the pores filled with air. The filtered water is conducted by underdrains to a collecting conduit and thence to the pump

well. The pumps determine the rate of filtration, and are speeded so that the water shall pass through the filter at the rate of 2,000,000 gallons per acre in 24 hours. From the pumps the water passes to the open distributing reservoir, which is 25 feet deep at high water and contains 40,000,000 gallons. The water then flows by gravity from the reservoir to the consumers.

From the time when the filter was put in operation, September 20th, 1893, until May 1st, 1894, daily bacteriological analyses, in addition to numerous chemical analyses, were made of the water before and after its passage through the filter, as it leaves the reservoir and from taps at the City Hall and Experiment Station, which are distant 1.5 and 2.5 miles, respectively, from the reservoir. The results were as follows:

	Average Number of Bacteria per Cubic Centimetre.	Average Percentage Removed of Number Applied.
River	10,900	....
Effluent at filter	264	97.58
Water from reservoir outlet	139	98.73
Water from tap at City Hall	90	99.17
Water from tap at Experiment Station	82	99 25

The above averages include all results. Excluding those results obtained under conditions which were abnormal and are not likely to occur again, we find that this filter normally reduced the bacteria from 9000 to 150 per cubic centimetre, a removal of 98.3 per cent of the number applied. Owing to the fact that some ground water of somewhat unsatisfactory quality with regard to numbers of bacteria was at times mixed with the effluent, it is very improbable that all the bacteria in the water pumped to the reservoir passed through the filter.

During the five years preceding the use of the filter the average annual death rate from typhoid-fever in Lawrence was 1.27 per 1000 inhabitants. The population of Lawrence is 50,000, and this average rate is equivalent to 63 actual deaths per year. During the past year there have been 26 deaths from typhoid-fever, a reduction of 60 per cent. Furthermore, it has been learned that of the 26 who died, 12 were operatives in the mills, each of whom was known to have

drunk unfiltered and polluted canal water, which is used in the factories at the sinks for washing. Among the operatives of one of the largest corporations, where canal water is not used, there has not been a single case of typhoid-fever during the past year.

The test of the efficiency of the filter during the past year has been a fair one, because at Lowell, the sewage of which enters the Merrimac River 9 miles above the intake of the Lawrence filter, there was during the past winter a severe epidemic of typhoid-fever.

In conclusion we may state that it has been found practicable to protect the consumers of an infected water supply by means of sand filtration.

THE INTERPRETATION OF WATER ANALYSES.

THE following clear exposition of the way in which a chemical analysis of drinking-water should be interpreted is well worthy of careful consideration by all who are interested in this subject. The writer, Dr. J. C. Thresh, of Essex County, England (*British Medical Journal*, August 18th, 1894), is well qualified to speak with authority upon the subject:

"Of the numerous substances found in potable waters, it is now generally admitted that only those of organic origin are a serious source of danger, and that by far the greatest risk is incurred in using water liable to contain certain living organisms, which, when introduced into the system, are capable of producing specific disease. Of the presence or absence of such organisms, chemical analysis can give us no information. The presence of organic matter may be chemically demonstrated, but, inasmuch as its nature, whether poisonous or innocuous, is beyond the power of the analyst to reveal, it is obvious that a mere chemical analysis may often be worthless or even misleading. This point cannot be too strongly emphasized, since the popular impression that the chemist, by performing a few mysterious experiments with a water in his laboratory, can pronounce at once whether it is pure or impure, safe or dangerous, is shared alike by the ignorant and

the learned, and must be dispelled. This opinion has been, and continues to be, fostered by analysts, who rarely hesitate to pass judgment upon a water from the determination of the chlorides, nitrates, phosphates, and ammonia, of the organic carbon and nitrogen, of the oxygen consumed, and of the ammonia derivable from the organic constituents. All these factors are of more or less importance as an index of the degree of pollution, recent or remote, but their real value can in very few cases be assessed without some previous knowledge of the source of the water. The inorganic constituents can easily be determined, and whether, either in quality or quantity, they are objectionable, the chemist may safely express an opinion. They are, therefore, chiefly of interest to us in so far as their presence tends to throw light upon the source of the organic matter, which in greater or lesser quantity is always present. Only under certain circumstances has the determination of chlorides any significance, and pure water from some sources may contain a larger amount of chlorides than the same water when contaminated. The importance of an estimation of nitrates was for a long time undervalued, at the present time the tendency is to greatly exaggerate it. The amount of nitrates which would condemn a water from one source may be absolutely without significance in a water from another. At certain schools it is taught that the presence of nitrites is conclusive evidence of the dangerous character of a water, yet these compounds may be derived from the most innocent sources, as by the reduction of nitrates by metals, cement, new brickwork, etc. Erroneous conclusions may also be drawn from the determination of phosphates, free oxygen, ammonia, and albuminoid ammonia. In the table of analyses [exhibited but not reproduced] the erroneous conclusions which may be deduced from a too great dependence upon analytical data are fully exemplified. The table is compiled from the reports of the medical inspectors of the Local Government Board, from the results of analysis made by well-known chemists, and from my own report books. In nearly every instance chemical analysis failed to find such evidence of pollution as would justify the analyst in condemning the water, yet these very waters were proved to have caused more or less serious outbreaks of disease. Although

a mere chemical examination cannot guarantee that a water is pure and can be used without risk, yet it can very frequently reveal to us impurity and danger. Chemical analysis, therefore, has its use; it is only when it is made the sole arbiter between safety and risk that it is abused and is liable to lead to errors fraught with most disastrous consequences. Let the analysis be as carefully made and as complete as possible, but let the results always be interpreted in the light afforded by a searching examination of the source of the sample. Let all so-called standards be abandoned as absurd, and let the opinion as to whether a water is dangerous or safe be based upon a full consideration of other more important factors. With the discovery of the fact that such diseases as typhoid-fever and cholera are due to the introduction into the system, not of dead organic matter, but of living organisms, faith in the chemical analysis of water began to be shaken. When, still more recently, the actual microbes causing these diseases had been identified, and processes had been devised for isolating them from the multitude of other organisms found in water, it seemed as though the examination of water for sanitary purposes had passed from the domain of the chemist into that of the bacteriologist. Further experience, however, is teaching us that the results of bacteriological examinations may be as misleading as those of chemical analyses. The cholera bacillus could not be demonstrated in the water poisoning the inhabitants of Hamburg and Altona; neither could the typhoid bacillus be found in the water supply which last year produced the epidemic in Worthing. Koch even falls back upon a standard of quantity, which is as illogical as the older chemical standards. Both depend upon quantity when the real point at issue is the quality. In reputedly good waters it has been observed that the micro-organisms present, capable of liquefying gelatine by their growth, are few in number, while in sewage-polluted water they abound. But this fact is of little value, since it only enables somewhat gross pollution to be detected, and most of these liquefying organisms are perfectly harmless. Bacteriology, like chemistry, may tell us something of impurity and hazard, but neither can be depended upon to determine with certainty whether a water is actually injurious to health. The possi-

bility of occasional pollution is a point too often overlooked, yet it is to such accidental pollution that outbreaks of disease are most frequently attributed, and of the liability to this the examination of samples of water, prior to the occurrence of the contamination, may tell us little or nothing. The danger of such pollution does not, unfortunately, vary with the amount of any constituent found in the water, and a source yielding a water of great chemical and bacterial purity may be more liable to occasional fouling than a source yielding water containing excessive quantities of chlorides and nitrates, unoxidized organic matter, or even living organisms. Bacteriological and microscopical examinations, as well as chemical analysis, must, therefore, always be associated with a thorough investigation of the source of the water to determine the possibility of contamination, continuous or intermittent, and a guardedly expressed opinion given only after a full consideration of the bearing of the one upon the other. When a water is known to be fouled by sewage, or known to be liable to such pollution, any form of examination is superfluous, and as neither bacteriology nor chemistry can be depended upon to prove that a water is free from all dangerous pollution, such examinations are, in many cases, quite useless."

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IMMIGRATION. — The annual report of the Superintendent of Immigration shows that during the fiscal year ended June 30th, 1894, 288,020 immigrants arrived in this country, of whom 285,631 were landed and 2389 debarred from landing because of being under contract to perform labor made previous to their arrival. Of the immigrants landed, 96,000 were destined for New York State, 42,000 for Pennsylvania, 25,000 for Massachusetts, and 22,000 for Illinois, the others being scattered throughout the United States, no other State receiving a greater number than 10,000. Immigrants destined for Southern States, all told, did not exceed 12,000. Of the immigrants over sixteen years of age, 41,000 could not read or write.

MORTALITY AND MORBILITY REPORTS.

By Harry Kent Bell, M.D.

Alabama.—Jerome Cochrane, M.D., State Health Officer, Montgomery.

Mobile, 31,076: T. S. Scales, M.D., Health Officer, reports for the month of October a mortality of 71, of which 32 were colored, and 21 were under five years of age. The annual death-rate per 1000 was 27.36.

Zymotic diseases caused 10 deaths, and consumption, 12.

Mobile has determined to be on a par with other modern cities, and has taken the first steps necessary looking to the establishment of waterworks for the city. The plan adopted by the General Council, which calls for the issuance of bonds amounting to $400,000, meets with general approval. It is hoped the Legislature will not delay in passing the bill which will be submitted to them, in order that the city may take advantage of the circumstance of cheap piping. Piping is now said to be cheaper than at any time ever known in the history of the United States, and there is no assurance that it will remain so, as it is in fact too low, and with any demand the price will increase.

Arizona.

Phœnix.—On Centre Street, about midway between Phœnix and the river, is a fine hot-bed of *typhoid-fever*. The street is low, and manure has been carefully dumped there. Overflow from the irrigating ditch that runs down the middle of the road has leached out a fine supply of assorted disease germs, so that anybody can inhale almost any sort of miasm by simply passing that way.

Arkansas.—John I. Hancock, M.D., President, Argentina; D. W. Holman, Secretary, Little Rock.

California.—C. W. Nutting, M.D., President, Etna Mills; J. R. Laine, M.D., Secretary, Sacramento.

For the month of October the reports from 69 cities, towns, villages, and sanitary dstricts, aggregating a population of 742,873, show a mortality of 1022—a death-rate of 16.44 per 1000 per annum.

There were 166 deaths from consumption, 63 from pneumonia, 20 from bronchitis, 1 from congestion of the lungs, 58 from diarrhœal diseases, and 91 from other diseases of the stomach and bowels, 24 from diphtheria and croup, 6 from whooping-cough, 27 from typhoid-fever, 10 from cerebro-spinal-fever, 46 from cancer, 1 from erysipelas, 91 from heart disease, 9 from alcoholism, and 4 from *la grippe*.

Reports of prevailing diseases from 36 localities, outside of the larger towns and cities, give 13 cases of pneumonia, 56 of bronchitis, 12 of pleurisy, 10 of congestion of the lungs, 165 of diarrhœal diseases, 24 of diphtheria and croup, 7 of measles, 73 of *la grippe*, 36 of typhoid-fever, 186 of malarial fevers, 8 of cerebro-spinal-fever, 8 of erysipelas, 55 of rheumatism, 61 of neuralgia, 60 of tonsilitis, and 45 of pharyngitis. Whooping-cough epidemic at St. Helena and Napa.

Diphtheria is epidemic at Los Angeles. Thirty-five cases were reported during the month of November, but with only 5 deaths. The Health Officer attributes them to several causes, including the use of water from shallow wells that gather *surface drainage*, the opening up of sewer trenches and the stirring up of cesspools and privy vaults.

COLORADO.—A. Stedman, M.D., President, Denver; Henry Sewell, M.D., Secretary, Denver.

Denver, November 15th.—Thirty-seven deaths from typhoid-fever have been reported up to date during the year. Both diphtheria and scarlet-fever are on the increase, but as yet nothing like an epidemic.

CONNECTICUT.—Professor William H. Brewer, Ph.D., New Haven, President; Professor C. A. Lindsley, M.D., Secretary, New Haven.

The mortality report for October has been received from 166 towns in the State. There were 994 deaths reported in the State during the month. This was 189 less than in September, and 74 less than in October, 1893, and 68 less than

the average number of deaths in October for the five years preceding the present. The death-rate was 14.6 for the large towns, 14.7 for the small towns, and 14.6 for the whole State. Tne deaths from zymotic diseases were 189, being 19 per cent of the total mortality. There were 113 deaths from consumption.

A committee has been appointed to report on the most advisable method of proceeding in this State to limit the spread of consumption. The Connecticut Medical Society has also appointed a committee to secure such legislation as may be necessary for the better control of the disease.

DELAWARE.—E. W. Cooper, M.D., President, Camden; E. B. Frazer, Secretary, Wilmington.

There are 16 towns in the State having boards of health, including the city of Wilmington, whose population census of 1890 is 61,431. The other towns are small, Newcastle, the next largest, having about 4000 inhabitants.

Wilmington is the only town making reports.

For the year ending June 30th, 1894, there were reported in the State 2417 deaths in a population of 168,493 (1890)—248 less than the previous year. Death-rate, 14.34 per 1000.

From consumption there were 285, a decrease of 28; pneumonia, 186, increase 3; typhoid-fever, 88, increase 7; diphtheria and croup, 51, decrease 37; dysentery, 31, increase 2; cholera infantum, 136, increase 24; heart-diseases, 170, decrease 17.

DISTRICT OF COLUMBIA, 250,000: W. C. Woodward, M.D., Health Officer.

Mortality report for the four weeks ending November 24th, 414, of which number 192 were of colored people, and 118 were under five years of age. The annual death-rate was 17.5 per 1000. There were 87 deaths from zymotic diseases, and 53 from consumption.

The total mortality for the year ending June 30th, 1893, was 6452, of which 2775 were colored. Deaths under five years of age numbered 2361, of which 1275 were colored. The death-rates were 18.8 for the whites 30.8 for the colored, and 22.6 for the whole population per 1000. From zymotic

diseases there were 1325 deaths, 20.5 per cent of the total. Consumption caused 681 deaths.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M.D., Secretary, Jacksonville.

The summary, as published in *Florida Health Notes* for the month of September, is as follows:

Number of counties reporting, 45; number of cities reporting, 3; total population of said counties and cities, 391,422; number of births reported, 582; number of marriages reported, 371; number of deaths reported, 319; birth-rate per 1000 per annum, 17.02; death-rate per 1000 per annum, 9.73; average age of this month's decedents, 28.42; number of deaths under five years of age, 107; number of deaths over seventy years of age, 31; number of deaths by violence, 10; number of premature and still-births, 9.

ILLINOIS.—William E. Quine, M.D., President, Chicago; J. W. Scott, Secretary, Springfield.

The State Board has taken the initiative in a very important necessity for the prevention of small-pox. The proposition is to lay before the Geneal Assembly a bill to establish a State vaccine farm at the University of Illinois, Champaign. The university was originally an agricultural college, and it has a large tract of land under cultivation. The State ought to have a vaccine farm for the supply of vaccine matter for the physicians throughout the State, and no other place is so appropriate for it. Such legislation ought to be promptly secured. The winter is the season of special danger from small-pox. The demand of last year was so great for pure vaccine lymph that the real supply is said to have run short before the season was over.

Chicago, 1,600,000: A. R. Reynolds, M.D., Commissioner.

The mortality for October was 1916, of which number 789 were under five years of age. The annual death-rate per 1000 was 14.37. There were 604 deaths from zymotic diseases, and 165 from consumption. Typhoid-fever caused 68 deaths, diphtheria 104, scarlatina 8, and small-pox 40.

Pullman and *Kensington* are reported to be chronic nests of diphtheria and scarlet-fever, and the increase of these diseases

in these localities during the month of November verges upon an epidemic. November 15th an employé of the Health Department stated that West Pullman and Kensington had been stricken with these diseases at certain seasons for several years. He further stated that this was due in a large measure to the terrible condition of the catch basins and the general faulty construction of the sewer system in Mr. Pullman's model town.

The sanitary conditions there are of the poorest kind, and, owing to Mr. Pullman's policy of neglecting to give them any attention at all, they are highly favorable to just such outbreaks of these dreaded diseases as are now raging in that locality.

Quincy is suffering the results of *polluted water.* During the month of November 83 cases of typhoid-fever were reported, and of this number 5 proved fatal; total number of diphtheria cases reported, 5, of which 2 were fatal; total deaths from other causes, 38. An investigation of typhoid-fever cases last year showed that in nine cases out of ten the families were using cistern water, while this year, in seven cases out of ten, hydrant water had been used.

The Secretary also reported that, in accordance with the instructions of the Board, he had examined the water in use in the schools of the city, and then exhibited the result of the tests, which showed the following:

Washington school, very bad; St. Boniface school, bad; Franklin school, good; Highland school, bad; Jackson school, bad; Berrian school, good; Jefferson school, fair; Irving school, fair.

At *Five Points*, a small village east of Brocton, in Edgar County, there were reported, November 17th, over 20 cases of diphtheria, requiring the closure of all the schools to keep the disease from spreading.

INDIANA.—S. S. Boots, M.D., President, Greenfield; C. N. Metcalf, M.D., Secretary, Indianapolis.

Cedar Rapids, November 15th.—Eight cases of scarlet-fever have been developed from a dairyman's milk. A girl who contracted the disease here visited before her recovery the family of a dairyman in the country. The children of the dairy farmer contracted the disease. Later the family of the retail

dairyman who purchased milk of the farmer was seized with the malady, and since then a number of cases have originated among the patrons of the retailer. The health officers are investigating the outbreak.

IOWA.—Frederick Becker, M.D., President, Claremont; J. F. Kennedy, M.D., Secretary, Des Moines.

The *Monthly Bulletin* reports for the month of October:

Davenport, 35,500: Mortality, 40. Annual death-rate per 1000, 13.5. Deaths under five years, 10. Zymotic diseases caused 4 deaths, and consumption, 3.

Keokuk, 18,000: Mortality, 22. Annual death-rate per 1000, 16.8.

Ottumwa, 16,000: Mortality, 20. Annual death-rate per 1000, 16.8.

KANSAS.—J. P. Stewart, M.D., President, Clay Centre; H. A. Dykes, M.D., Secretary, Topeka.

KENTUCKY.—Joseph M. Matthews, M.D., President, Louisville; J. N. McCormack, M.D., Secretary, Bowling Green.

LOUISIANA.—S. R. Oliphant, President, New Orleans; W. R. Harnan, M.D., Secretary, New Orleans.

New Orleans, 254,000—184,500 white, 69,500 colored. There were reported for four weeks ending November 24th, 575 deaths, of which number 212 were among the colored people, and 160 of children under five years of age. Annual death-rate per 1000, 29.52. Zymotic diseases caused 95 deaths, and consumption, 58.

Diphtheria has rapidly increased in New Orleans during the past three months, the number of fatal cases being large. But at latest reports, under the use of the anti-toxine treatment, the mortality was lessening. The plant for the cultivation of the serum is in progress.

A war has been begun, none too soon, on food adulteration in New Orleans by the Board of Health. Molasses was the first article to which they turned their attention. Last February the Board analyzed samples of molasses sold by the grocers, and found that zinc was being generally used in the process

of clarifying. This practice was defended on the ground that the zinc precipitated foreign matter and left the molasses a clear amber color. The analysis showed, however, that some of the zinc remained in the molasses, to the great danger of the public health. An order was immediately issued by the Board that zinc should be no longer used by the manufacturers. Everything which presents an opportunity for adulteration will be analyzed, and the law governing the case will be applied. The inspectors of the Board will select samples of all food products, including canned goods, wines, beer, bread, flour, dried fruits, spices, and, in fact, all articles which are consumed for food. Later on the efforts of the Board will be directed against the adulteration of drugs.

MAINE.—C. D. Smith, M.D., President, Portland; A. G. Young, M.D., Secretary, Augusta.

Farmington has had an outbreak of diphtheria, attributed to defective sewerage, or apparently the dissemination of filth without sewerage. A committee appointed at a recent meeting of the village corporation is now investigating the matter, and will report soon.

MARYLAND.—John Morris, M.D., President, Baltimore; James A. Steuart, M.D., Secretary, Baltimore.

Baltimore, 455,427: James F. McShane, M.D., Commissioner, reports for October that the total deaths were 746, an increase of 159 compared with the corresponding month of October, 1893. Of these 592 were whites and 154 colored—a death-rate of 18.50 per 1000 for the former and 25.93 per 1000 for the latter. The death-rate per 1000 for the whole population was 19.89. Seventy-one died from infectious diseases, 93 from consumption, 37 from pneumonia, 19 from bronchitis, 10 from cholera-infantum, 16 from diarrhœa, 9 from dysentery, 7 from enterocolitis, 4 from enteritis, 7 from gastro-enteritis, and 31 from typhoid-fever. Two hundred and sixty-six, or 35.52 per cent of the total deaths, were in children under five years of age.

During the month 160 cases of infectious diseases were reported, an increase of 25 compared with the preceding month.

MASSACHUSETTS.—H. P. Walcott, M.D., Chairman, Cambridge; S. W. Abbott, M.D., Secretary, Boston.

Boston, 501,107: S. H. Durgin, M.D., Chairman, reports for the month of October 925 deaths, of which number 340 were under five years of age.

The annual death-rate was 22.15 per 1000. From zymotic, including tuberculosis (128) diseases there were 354 deaths, of which 109 were due to diphtheria, 27 to typhoid-fever, 12 to scarlatina, 4 to whooping-cough. Of these diseases there were reported during the month: Diphtheria, 458; typhoid-fever, 197; scarlatina, 182; measles, 58.

The Board of Health is earnestly engaged in the establishment of the serum plant, and meanwhile neglecting no known means for stamping out diphtheria. Special tongue depressors, made of wood, are supplied and ordered for use, and then to be burned up, in order to do away with any danger of disease being conveyed to some other person through any carelessness on the part of the physician.

The School Board, besides burning the school books that have been subject to much handling, on the recommendation of the health authorities have also ordered the discontinuance of slates, slate pencils, and sponges in the public schools and the substitution of paper, lead-pencils, and rubber erasers in their place, for which they assign the following excellent reasons:

1. A light gray mark upon a slightly darker gray surface is more or less indistinct and trying to the eyesight.

2. The resistance of the hard pencil upon the hard slate is tiring to the muscles, and the resistance to which the muscles are thus trained must be overcome when beginning to write with pencil or pen upon paper.

3. The use of slates, slate pencils, and sponges is a very uncleanly custom, and leads to and establishes very uncleanly habits.

These are good and sufficient reasons, but the important consideration, after all, is on the score of the health of the pupils. The school committee is to be congratulated on its action in banishing these articles from the school-room, and we think they have set an example which should be followed elsewhere.

In *Quincy* diphtheria is also reported to an alarming extent. December 26th, 13 new cases had been reported during the three days preceding, and several of them among the pupils of the Adams and Willard schools. The Board of Health adopted the method of placing red cards upon all buildings where the disease exists as a warning to people to keep away, and announced that if the disease appeared to any extent in any of the other school buildings they would be promptly closed.

Amherst, November 17th.—The Amherst students and townspeople are much alarmed over the prevalence of typhoid-fever cases, regardless of some of the official reports, showing that the water from Pelham reservoir is practically pure. Dr. Perry, who has had charge of the larger number of typhoid patients, says there is no cause for further alarm. Nevertheless, it is a fact that the cases continue to increase.

Waltham, December 20th.—Diphtheria has been very prevalent the present year, there being up to date 90 cases, as against 35 last year. Nineteen of the cases have resulted fatally. Of that number 17 occurred previous to November 17th.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M.D., Secretary, Lansing.

The Secretary reports that for the month of November, compared with the preceding month, pneumonia increased, and diarrhœa, typhoid-fever, and intermittent fever decreased in area of prevalence.

Compared with the average for corresponding months in the eight years 1886–93, intermittent-fever, consumption, remittent-fever, and erysipelas were less prevalent in November, 1894.

Including reports by regular observers and others, consumption was reported present in Michigan in the month of November, 1894, at two hundred and twenty-nine places; typhoid-fever at one hundred and sixteen places; scarlet-fever at one hundred and nine places; diphtheria at eighty-six places; measles at ten places, and small-pox at nine places.

Reports from all sources show consumption reported at seven places less; typhoid-fever at forty-nine places less;

scarlet-fever at seven places more; diphtheria at four places more, and small-pox at one place more than in the preceding month. Measles was reported at the same number of places as in the month of October.

Detroit, 275,000: J. Schulte, M.D., President; N. W. Webber, M.D., Acting Health Officer. There were 322 deaths reported during October, representing an annual death-rate of 13.79 per 1000. Deaths under the age of five years numbered 131. There were 77 deaths from zymotic diseases, and 27 from consumption.

Diphtheria continues unabated. The record of the first week in December showed that there were in existence 67 cases of diphtheria, of which 48 cases are new ones reported during the week. The number of deaths from the disease for the week was 15. Of scarlet-fever there are 28 cases existing, and 5 of them are new cases.

During a period of two months, beginning with October 6th and ending December 8th, making 64 days, there was a total of 324 cases of diphtheria, an average for 64 days of 5 new cases of diphtheria per day. Out of the total number of 324 cases there have been 75 deaths, showing that almost one fourth of the cases resulted fatally.

The Board of Health has finally ordered the closing of every public school in the city until the epidemic abates. But whether the children were allowed to take the school books home with them, or a bonfire made of them—as should have been done—we are not informed. It is gratifying to note that the public-spirited firm of Parke, Davis & Co. have undertaken to establish a manufacturing plant of anti-toxine serum for the *treatment* of the disease, but on measures for its prevention we have no report.

MINNESOTA.—Franklin Staples, M.D., President, Winona; C. N. Hewitt, M.D., Secretary, Red Wing.

Minneapolis, 223,700: E. S. Kelley, M.D., Commissioner, reports for October 167 deaths, of which number 52 were under five years of age. The annual death-rate per 1000 was 9.40. From zymotic diseases there were 37 deaths, of which 18 were from typhoid-fever; and from consumption, 19.

Minneapolis is very properly exercised over her water supply.

" The Mississippi River is the only logical and feasible source from which Minneapolis can get its water supply. But under the present condition of things, including the city sewage system and the location of the sewers, the extensive logging operations above the city, and the sewage from sister cities to the north, this supply at present is not what it ought to be in point of purity. Hence the water for domestic use in Minneapolis should be properly filtered."

Dr. C. N. Hewitt, Secretary of the State Board of Health, gave voice to the above opinion at a recent meeting of the Minnesota Academy of Natural Sciences. After a lucid description of the water sources of Minnesota, he returned, for contrast, to the foulness of the Mississippi River water as a medium in which certain disease germs thrived and increased to an alarming extent. There were, he said, probably 30 or 40 different kinds of germs in the river water. Not all of these germs, however, were dangerous, but, on the contrary, many were useful and necessary. The germs which thrived and which were a menace were those of typhoid-fever and those of diphtheria.

Dr. Hewitt's address was followed by a discussion, in which Dr. E. S. Kelley, City Health Commissioner, urged filtration. In speaking of the sewage which tainted the water, Dr. Kelley told of the frightful contamination by the discharges from the Union Depot, Nicollet Avenue sewers, and other mains which emptied their filth but a few hundred feet from the city pumping stations. "And yet we are a healthy city," remarked the Health Commissioner. " We are a hardy, robust race, we people of Minneapolis, and this is all that saves us."

Professor Winchell, who is an ardent advocate of the artesian-well supply, which he said was free from life germs, made an interesting plea for this system.

Dr. Hewitt said that St. Paul was rich in possibilities in the way of water supplies which might be tapped and created. The St. Croix River, he said, was phenomenally pure, and ranked in purity with the waters of Lake Superior. Dr. Hewitt also presented a valuable table showing the results of over 1500 analyses of samples of water, the experiments covering a period of fifteen years.

St. Paul, 155,000: H. F. Hoyt, M.D., Commissioner re-

ports for October 108 deaths, of which 45 were under five years of age. The annual death-rate per 1000 was 8.36. Zymotic diseases caused 24 deaths, and consumption, 7. There were 47 cases of contagious diseases reported.

MISSISSIPPI.—W. F. Hyer, M.D., President, Meriden; Wirt Johnson, M.D., Secretary, Jackson.

MISSOURI.—F. J. Lutz, M.D., President, St. Louis; William P. King, M.D., Secretary, Kansas City.

The State Board is seriously concerned in regard to the contamination of the Mississippi River by the Chicago "sewer" (the Illinois River *via* the canal) emptying into the Mississippi, may be brought to bear very seriously upon the municipal government of Chicago, if their plan of action is carried out. It is claimed that the outpour of filth from Chicago will prove very damaging to the cities and towns in this State dependent upon the Mississippi River for their water supply. It is also claimed that its effects will be noticed farther south than St. Louis, and the members of the Board believe it to be their duty to prevent the scheme being put into operation.

It was decided at a conference of the Board, December 9th, to construct a resolution showing the imminent danger and present it to the delegates for consideration at the meeting of the State Boards of Health, at Washington, D. C., December 12th, of which we shall probably have a report in next issue.

St. Louis, 540,000: George Homan, M.D., Commissioner of Health.

During the month of November there were 670 deaths, of which 199 were under five years of age. The annual death-rate per 1000 was 14.8. Zymotic diseases caused 152 deaths, and consumption, 83.

The seventeenth annual report gives the statistics for the year 1893: Total mortality, 10,303, representing a death-rate of 19.8 per 1000. There were 3548 deaths under five years of age. Zymotic diseases caused 2013 deaths, of which the chief were, diphtheria and croup, 371; typhoid-fever, 215; malarial-fevers, 284; diarrhœal diseases, 681; scarlatina, 79. Consumption caused 984 deaths; pneumonia, 879; bronchitis, 454, and influenza, 166.

At a meeting of the Board of Health, December 9th, it was decided to prepare serum for the anti-toxine treatment of diphtheria, and also to purchase the apparatus to make bacteriological tests in doubtful cases.

Kansas City, November 30th.—There has been an outbreak of diphtheria among the pupils of Switzar School, and so far, during the month, in about 25 houses not far away. Health Officer Waring has requested the Board of Education to close the school.

NEBRASKA.—J. V. Beghtol, M.D., President, Friend; F. D. Haldeman, M.D., Secretary, Ord.

Omaha, November 28th.—The reports received by the Board of Health indicate that the epidemic of scarlet-fever is quite prevalent among the school children of the city.

Chanute, November 24th.—Diphtheria is so prevalent in Chanute that the Mayor has prohibited performances at the opera-house, and parents are warned to keep their children off the streets.

NEVADA.—S. L. Lee, M.D., President, Carson City; J. A. Lewis, M.D., Secretary, Reno.

NEW HAMPSHIRE.—G. P. Conn, M.D., President, Concord; Irving A. Watson, M.D., Secretary, Concord.

NEW JERSEY.—C. F. Brackett, M.D., President, Princeton; Henry Mitchell, M.D., Secretary, Asbury Park.

Trenton, November 20th.—A special meeting of the Board of Health was held to take action regarding the prevalence and spread of diphtheria among public-school children throughout the city. As a result, two of the schools, the Hewitt and Centennial, were ordered closed until all danger of contagion is over. Sixty-eight cases of diphtheria were reported to the Board of Health during October, and so far this month nearly 60 cases are on record.

NEW YORK.—F. O. Donohue, M.D., President, Syracuse; J. S. Barnes, M.D., Secretary, Albany.

The State Board *Bulletin* reports for the month of October

that the mortality for the month has decreased from a daily average of 311 to one of 290, which is identical with that of the corresponding month of last year. The average daily death-rate for the preceding nine months was 335. The death-rate per 1000 population annually was about 16.60, against 17.50 in September and 19.15 in August. In 150 cities and villages, representing 75 per cent of the population, the death-rate was 17.75, against 18.85 in September, showing a material decrease in the urban mortality. In six large cities there were about 200 fewer deaths than in September. There was a proportionate reduction in the rural mortality, the reported deaths from the same sparsely populated towns being 250 fewer than in September. The infant mortality was greatly reduced, the number of deaths under five years being 1000 less than in September. From zymotic diseases there were 1420 deaths, against 2320 in September and 1540 in October, 1893; 18.0 per cent of the total mortality was from these causes, against an average for this month for ten years of 19.0. There were 800 fewer deaths from diarrhœal diseases than in September; the mortality was, however, up to the average for the month. The customary fall increase from diphtheria, which did not show itself in September, has appeared, having caused 170 more deaths, but the mortality is a little less than a year ago; the increase is confined to the large cities. From typhoid-fever the number of deaths has not increased. Scarlet-fever continues but lightly prevalent, and caused but 32 deaths. There was an increase of nearly 250 in deaths from acute respiratory diseases, as is usual. Consumption caused 1012 deaths, or very nearly the average for the nine months preceding. There was generally throughout the State an excess of rainfall of about one inch. The average temperature for the month was 2.6° above the average. Frost first occurred on the 11th. The relative humidity was the same as last month. Prevailing winds were southerly in the central part of the State and northerly in the south and west.

New York, 1,925,562: Total deaths, 2901—1054 under five years. Death-rate, 17.75. Zymotic diseases per 1000 deaths from all causes, 153.10. Deaths from consumption, 358.

The anti-toxine treatment of diphtheria continues favorable; but it has become necessary to caution physicians

against the use of spurious, or, to say the least, "weak," serum on the market. Thirty thousand dollars has been appropriated to the Health Department for the establishment and maintenance of a serum-culture plant. The *Herald* Fund, as universally known, is also to be placed under the direction of the Health Department to aid in the purpose.

Brooklyn, 1,012,200: Total deaths for October, 1710—716 under five years. Death-rate, 20. Zymotic diseases per 1000 deaths from all causes, 210.52. Deaths from consumption, 184.

Diphtheria continues unabated. For the week ending December 15th the number of deaths reported from diphtheria and croup (5) was 39; but the death-rate in the aggregate for that week was remarkably low—15.8 per 1000.

The anti-toxine treatment of diphtheria has been used to some extent, and, as elsewhere, its results favorably reported upon.

Syracuse, 91.944: Total deaths for October, 135—33 under five years. Death-rate, 17.62. Zymotic diseases per 1000 deaths from all causes, 170. From consumption, 14.

Albany, 98,000: Total deaths, 142—30 under five years. Death-rate, 12.32. Zymotic diseases per 1000 deaths from all causes, 143. From consumption, 26.

Buffalo, 300,000: Total deaths, 440—184 under five years. Death-rate, 17.60. Zymotic diseases per 1000 deaths from all causes, 300. From consumption, 43.

Rochester, 150,000: Total deaths, 165—54 under five years. Death-rate, 13.00. Zymotic diseases per 1000 deaths from all causes, 141.12. From consumption, 14.

Yonkers, November 24th.—Diphtheria is epidemic, and several of the public schools closed.

Haverstraw, November 14th.—Many cases of diphtheria and scarlet-fever have been reported in this village, and yesterday nearly one thousand public-school children were sent home and the schools were closed. The Board of Education has decided, however, that the schools shall be kept open unless the sickness spreads.

NORTH CAROLINA.—H. T. Bahnson, M.D., President, Salem; Richard H. Lewis, M.D., Secretary, Raleigh.

From the *Bulletin* of the State Board of Health we find that during October there were 199 deaths in 30 towns, aggregating 147,354 population; 110 were of colored people, and 54 were of children under five years of age.

The annual death-rates were 12.3 per 1000 for the white population, 21.7 for the colored population, and 16.2 for the total. There were 28 deaths from consumption, 11 from typhoid-fever, 6 from pneumonia, and 13 from diarrhœal diseases.

Asheville, 12,000: Total deaths, 12. Annual death-rate, 12 per 1000.

Charlotte, 14,000: Total deaths, 17. Annual death-rate, 13.6 per 1000.

Raleigh, 15,000: Total deaths, 23. Annual death-rate, 18.4 per 1000.

Wilmington, 22,000: Total deaths, 37. Annual death-rate, 20.2 per 1000.

NORTH DAKOTA.—Hon. W. H. Standish, President, Bismarck; F. H. DeVaux, M.D., Superintendent, Valley City.

OHIO.—Byron Stanton, M.D., President, Cincinnati; C. O. Probst, M.D., Secretary, Columbus.

Cincinnati, December 15th, J. W. Pendergrast, M.D., Health Officer.—Typhoid-fever is increasingly prevalent. There are 50 cases in the City Hospital, and the other hospitals also have a large number.

Toledo, 120,000: J. Wood, M.D., Health Officer, reports for October a mortality of 139, of which 66 were under five years of age, representing an annual death-rate of 13.90 per 1000. There were 28 deaths from zymotic diseases, and from consumption, 8.

Cleveland, December 13th.—Diphtheria is so prevalent that the people are well-nigh panic-stricken. All the public schools are closed. The present epidemic started December 5th, and on last Saturday night about 30 cases had been reported. To-day the Board of Health put out a bulletin stating that the total number of cases officially reported up to noon was 57, including 10 new cases reported to-day. Since Saturday night there have been 9 deaths from diphtheria. The Board of

Health is doing everything possible to cope with the disease. Dr. Probst, of the State Board, has been telegraphed for, and is expected here to-morrow.

Scarlet-fever is also exceedingly prevalent. There are supposed to be, at the present time, not less than 1000 cases in the city.

Ashtabula, December 12th.—Diphtheria in malignant form is epidemic here, and numbers its victims in all sections of the city. There are now nearly 100 cases reported. The city is panic-stricken, and many families are leaving until the epidemic is under control.

OKLAHOMA TERRITORY.—L. L. Parker, President, Kingfisher; C. D. Arnold, M.D., Secretary, El Reno.

PENNSYLVANIA.—S. T. Davis, M.D., President, Lancaster; Benjamin Lee, M.D., Secretary, Philadelphia.

The Secretary reports that there are now 417 local boards of health now organized in the State.

Philadelphia, 1,139,457: M. Veale, Health Officer, reports: In the four weeks ending November 24th there were 1523 deaths, of which number 490 were under five years of age. Annual death-rate, 17.4 per 1000. Deaths from consumption numbered 179; from zymotic diseases, 247.

Small-pox.—Number of cases reported up to November 27th, 34; cases reported since November 27th, 30; deaths since November 27th, 3; cases in quarantine, 40; at the Municipal Hospital, 24; at private houses, 16, and 10 houses quarantined.

Diphtheria.—Number of cases reported since November 27th, 435; deaths, 145.

Pittsburg, 272,000: J. Guy McCandless, M.D., Registrar, reports: During the four weeks ending November 24th there were 331 deaths, of which 125 were under five years of age. Deaths from zymotic diseases, 47; consumption, 31. Annual death-rate, 15.82.

Spring City, December 12th.—Diphtheria is epidemic. The schools are closed, and the physicians are kept busy night and day attending to those afflicted, and they report that there are fully 40 cases in the borough, and new ones are being added to the list daily.

RHODE ISLAND.—A. G. Sprague, M.D., President, River Point; Gardner T. Swarts, Secretary, Providence.

For the month of August there were reported 620 deaths in an estimated population of 370,239, representing an annual death-rate of 27.24 per 1000. There were 189 deaths from zymotic diseases and 39 from consumption.

SOUTH CAROLINA.—J. R. Bratton, M.D., Chairman, Yorkville; H. D. Fraser, M.D., Secretary, Charleston.

Charleston, 28,870 white, 36,295 colored: 65,165: H. B. Horlbeck, M.D., Health Officer, reports for the four weeks ending November 24th, deaths, 130—85 colored. Deaths under five years, 41. Annual death-rate, 25.93. Zymotic diseases, 18, consumption, 11.

SOUTH DAKOTA.—C. B. Alford, M.D., President, Huron.

TENNESSEE.—J. D. Plunkett, M.D., President, Nashville; J. Berrien Lindsley, M.D., Secretary, Nashville.

The principal diseases, named by the *Bulletin* in the order of their greater prevalence, in the State for the month of October, were typhoid-fever, malarial-fever, lung diseases, acute scarlet-fever, consumption, diphtheria, whooping-cough, rheumatism, and *la grippe*.

Chattanooga, 40,000: Total deaths, 26—colored, 15. Annual death-rates per 1000, white, 4.88; colored, 13.84: total, 7.80.

Knoxville, 40.385: Total deaths, 61—colored, 29. Annual death-rates per 1000, white, 12.27; colored, 38.18: 18.12.

Memphis, 57,951: Total deaths, 100—colored, 50. Annual death-rates per 1000, white, 18.63; colored, 23.46: 20.70.

Nashville, 87,754: Total deaths, 117—colored, 53. Annual death-rates per 1000, white, 14.06; colored, 19.18: 15.99.

TEXAS.—R. M. Swearingen, M.D., State Health Officer, Austin.

UTAH TERRITORY.

Salt Lake City, W. T. Dalby, M.D., Health Commissioner.

Salina, November 29th.—Typhoid-fever is prevalent here

and round about, attributed to foul water from too little attention to sheep herds in the vicinity.

VERMONT.—C. S. Caverly, M.D., President, Rutland; J. H. Hamilton, M.D., Secretary, Ritchford.

VIRGINIA.—R. W. Martin, M.D., President, Chatham; A. Irving, M.D., Secretary, Richmond.

WASHINGTON.—J. R. Hathaway, M.D., President, Everett; G. S. Armstrong, M.D., Secretary, Olympia.

The following statistics are taken from the second annual report for the year ending September 30th, 1893. Total mortality, 1278, of which 365 were under five years of age. From zymotic diseases there were 275 deaths, and from consumption, 125.

WEST VIRGINIA.—W. P. Ewing, M.D., President, Charleston; N. D. Baker, Secretary, Martinsburg.

WISCONSIN.—Solon Marks, M.D., President, Milwaukee; U. O. B. Wingate, M.D., Secretary, Milwaukee.

Milwaukee, 270,000: W. Kempster, M.D., Commissioner, reports for October a mortality of 406, of which 201 were under five years of age.

Cases of infectious diseases reported: Diphtheria, 45; scarlet-fever, 10; small-pox, 263; typhoid-fever, 30: 348. Admitted to City Isolation Hospital, 129.

Deaths from diphtheria and croup, 26; typhoid-fever, 10; diarrhœal diseases, 32; consumption, 27.

Appleton, December 5th.—This fall there has been a large amount of disease, contagious and otherwise, which all the physicians agree has not been equalled for years. The reports to the Health Officer are only on the two diseases, scarlet-fever and diphtheria. The roll of the first includes 20 cases, of the other, 14; and Dr. Ellsworth estimates the number of typhoid cases at 10. These are manifestly incomplete, especially the reports on diphtheria, for there have been nearly as many deaths as there are cases reported. The record of scarlet-fever is more difficult to get. But there is manifestly an underestimate on typhoid-fever. One physician alone tells of 8 cases

of diphtheria, none of which were reported. Another one has 7. The probabilities are that the record will mount to nearer 40 than 14. The typhoid roll, too, will not come far from that figure.

PROVINCIAL BOARD OF HEALTH OF NEW BRUNSWICK.—William Bayard, M.D., Chairman, St. John; George E. Coulthard, M.D., Secretary, Fredericton.

PROVINCIAL BOARD OF HEALTH OF NOVA SCOTIA.—Hon. W. S. Fielding, Premier and Provincial Secretary, Chairman; A. P. Reid, M.D., Secretary, Halifax.

PROVINCIAL BOARD OF HEALTH OF ONTARIO.—John Duff Macdonald, M.D., Chairman, Hamilton; Peter H. Bryce, M.D., Secretary, Toronto.

December 7th.—The Provincial Health Board has received notice that serious dissatisfaction exists in Wyoming, near Petrolea, in Lambton County, in regard to the prevalence of diphtheria there. It is said that no precautions are taken to prevent the spread of the disease, and great indignation exists among the people of the neighborhood.

Hamilton, November 23d.—Diphtheria is epidemic and increasing.

PROVINCIAL BOARD OF HEALTH OF QUEBEC.—E. P. Lachapelle, M.D., President, Montreal; Elzear Pelletier, M.D., Secretary, Montreal.

Montreal, November 14th.—Scarlet-fever and diphtheria have suddenly become epidemic here, and were declared so at the meeting of the Civil Health Board to-day. Seventeen cases of scarlet-fever and diphtheria are known to exist in the Protestant Infants' Home and 12 in the Foundlings' Home. There have been 5 deaths.

Ottawa, November 29th.—Diphtheria is raging in the vicinity of Kinburn and throughout the township of Fitzroy. There were 10 cases at Kinburn yesterday, and 3 deaths in one family.

MANITOBA.—John H. O'Donnell, M.D., Chairman, Winnipeg; C. J. Jamison, M.D., Secretary, Winnipeg.

SUPERIOR BOARD OF HEALTH OF MEXICO. — Eduardo Dicéaga, President, Mexico; José Ramirez, M.D., Secretary-General, Mexico.

Mexico.—A new project for the sanitation of the sewers of the City of Mexico, at a cost of about $25,000, calls for the building of some twenty-five windmills in different parts of the city, to rotate paddle-wheels in the sewers and quicken the current to one metre per second.

BUENOS AYRES, 580,371 : Albert B. Martinez, Director-General of Municipal Statistics.

There were 1341 deaths reported during the month of September, of which number 626 were under the age of five years. There were 109 deaths from epidemic diseases, and 108 from consumption. Annual death-rate per 1000, 27.7.

OBITUARY.

JOHN MILLS BROWNE, M.D., ex-Surgeon-General U. S. Navy, died in Washington, December 7th, 1894. He was born in Hinsdale, N. H., May 10th, 1831, and was graduated from the Medical Department of Harvard University in 1852. In the following year he entered the navy as an Assistant Surgeon and performed his first duty on board the steamship *Warren*. He was promoted to the rank of Passed Assistant Surgeon in 1858, and was made Surgeon in 1861. While serving as Surgeon of the *Kearsarge*, the famous engagement occurred off the coast of France, which resulted in the sinking of the *Alabama*. Ten years later he advanced to the rank of Medical Inspector, and in October, 1878, was promoted to the rank of Medical Director. He was appointed by President Harrison Surgeon-General of the United States Navy, and on the expiration of his term was reappointed and served until his retirement, one year and a half ago. He took high rank in Masonic circles, was a thirty-third degree Mason, and succeeded the late Albert Pike as Chief of the Scottish Rite for the Southern jurisdiction of the United States.

He was a genial and companionable man, who lived without reproach and died without fear. He was not only one of the ablest of his corps, but one known to be absolutely just in all his dealings with his brother officers and mankind in general.

EDITOR'S TABLE.

SANITARIAN, JANUARY NUMBER, 1895.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

THE LESSON OF THE DIPHTHERIA EPIDEMIC.

NO such fatal epidemic as that which now obtains ever before prevailed in the United States. Possibly it was necessary, in order to rouse the national authorities to a sense of their duty. The President has at last recognized the need of a national health service, but on a plane which may justly be claimed to be a mere elaboration of the service which already exists. The following is extracted from his message :

"I am entirely convinced that we ought not to be longer without a national board of health or national health officer charged with no other duties than such as pertain to the protection of our country from the invasion of pestilence and disease. This would involve the establishment, by such board or officer, of proper quarantine precautions or the necessary aid and counsel to local authorities on the subject, prompt advice and assistance to local boards of health or health officers in the suppression of contagious diseases, and in cases where there are no such local boards or officers, the immediate direction by the national board or officer, of measures of suppression, constant and authentic information concerning the health of foreign countries and all parts of our own country, as related to contagious diseases, and consideration of regulations to be enforced in foreign ports to prevent the introduction of contagion into our cities and the measures which should be adopted to secure their enforcement.

"There seems to be at this time a decided inclination to discuss measures of protection against contagious diseases in international conference with a view of adopting means of mutual assistance. The creation of such a national health establishment would greatly aid our standing in such conferences and improve our opportunities to avail ourselves of their benefits. I earnestly recommend the inauguration of a national board of health or similar national instrumentality, believing

the same to be a needed precaution against contagious disease and in the interest of the safety and health of our people."

For all that is here recommended, the National Quarantine Service is well-nigh adapted. It contemplates disease from afar—the popular but fallacious thought that the chief source of disease against which we have to contend is external to our domain. Yet during the one single month since the President delivered this message, the number of deaths from diphtheria and other epidemics of domestic origin has been greater than that of any whole year of any exotic disease that has ever gained admittance. And a resolution has been introduced in Congress to authorize the appointment of a committee to investigate and report on the anti-toxine treatment of diphtheria—a committee to rehearse that which has already been made known—to be published in the abstract of the sanitary reports now published by the Treasury Department in accordance with the act of Congress of February 15th, 1893.

To facilitate the quasi authenticity which the contemplated "investigation" and publication would authorize, attention is invited to the following extract from "Recent Science," by Prince Kropotkin, from *The Nineteenth Century* for December:

"In how far the serum treatment may be relied upon for man is still a question to be solved by experiment, and upon which Roux, Behring, Kitasato, Ehrlich, and all the explorers, as well as Lizzoni and Cattani, in Italy, are now busy at work. The brilliant successes announced from time to time in the daily papers must certainly be received with caution. But in view of the undoubted, though not always infallible, successes obtained with animals, and fair proportion of successful treatment of men, we can be hopeful. In some cases the cures have been most remarkable. Moreover we learn from statistics as we write these lines that Roux, at Paris, has obtained 74 per cent of cures in 300 ascertained cases of diphtheria, already treated by the serum; and that Professor Ehrlich, at Berlin, has had 85 per cent of recoveries in the 163 cases treated by the new method. There were only two failures out of the 72 cases in which serum was injected during the first two days of the disease. Such results are more than reassuring."

Besides, it has already been investigated and reported upon, under the auspices of the Marine Hospital Service, by Dr. Kinyoun, who confirms the previous reports of Dr. Biggs,

Bacteriologist of the Health Department of New York, and others who, in default of American facilities for acquiring knowledge necessary for the protection of the health of the people, have been obliged to seek them abroad.

Unfortunately, valuable as the anti-toxine treatment of diphtheria has been shown to be, the period of immunity from a recurrence of the disease is of short duration. Dr. Kinyoun reports, among the results of his investigation, that "the longest time in which it is thought to be protective is six weeks, one injection of from ten to twenty c.c. being sufficient."

Encouraging, therefore, as this knowledge is for the *treatment* of diphtheria, it should not be suffered to detract from the need of continued effort for its prevention.

Contagious as diphtheria is well known to be, all diligent students of it know that its introduction and spread are promoted by the emanations common to animal and vegetable matter in process of putrefaction. Of this there are some very striking examples of localities in the great epidemic now prevailing.

Hence city communities who have long tolerated manure storage of any kind in their midst; who, instead of having markets under the supervision of the sanitary authorities, permit fresh fish, meat, and vegetables as ordinary grocery stock on almost every block, and take no note of the danger to health consequent upon the dissemination of the putrefactive *débris* swept into the streets or stored in cellars throughout; and smaller communities, in like manner, who tolerate such conditions—*all* such are predisposed to the reception and maintenance of diphtheria and other epidemic diseases, contagious or otherwise. Indeed, it would be an easy matter to cite examples of such localities, where diphtheria has long been prevalent, and in several of them now epidemic. But they are so numerous that special designation is unnecessary.

BROOKLYN'S MOST INFAMOUS NUISANCE is at last to be abated—*if* Governor Flower's order is obeyed. After more than a dozen years' annual investigations by the N. Y. State Board of Health, December 11th, Governor Flower issued an order, of which the following is an abstract:

" In order to improve the sanitary condition of Newtown Creek and its surroundings so as to remove all menace to public health, and to the end that the nuisances above set forth may be abated, changed and removed;

" It is hereby ordered that all offensive drainage from manufacturing establishments be discharged into sewers which empty directly into the East River, and that Long Island City and the city of Brooklyn and the authorities of each of said cities named be enjoined and prohibited from discharging public sewers, directly or indirectly, into Newtown Creek.

" And I do hereby order and direct that the city of Long Island City and the city of Brooklyn, and the public authorities of said cities, be, and the same are hereby prohibited from discharging public sewers of said cities or sewage of any kind, directly or indirectly, from said cities into Newtown Creek.

" In relation to the factories that are offensive or liable to become so, it is hereby ordered that the business conducted at" (several establishments named) " be discontinued within ninety days from January 1st, 1895.

" No fat rendering shall be allowed upon Newtown Creek, and the same is hereby prohibited, except within such distance of the East River as to use, without difficulty, the waters of said river for condensing purposes or some source other than Newtown Creek, and that fat rendering upon Newtown Creek be and the same is hereby prohibited.

" That the material received at the offal dock be properly disinfected and removed daily.

" That the Eastern Distilling Company shall forthwith dredge the bulkhead where the drain from their works discharges into Newtown Creek; or that said nuisances be fully abated and removed."

Thirteen years ago this writer had occasion to say to an investigating committee of the State Board of Health that " he had been more or less familiar with the region for a number of years. That it had been, in the first place, the dumping ground of every species of movable filth from New York and Brooklyn; the creeks and tributary streamlets had been made the receptacles of Brooklyn sewage; establishments for rendering dead animals had been placed upon it, and more recently factories of various kinds, from which sludge acid and other offensive material were discharged, insomuch that if all the works thereabouts were now razed to the ground the stench would abound for five years to come, so thoroughly was it embedded in the soil." This was in 1881. A few of the

stench factories have been abated, while the greatest of them, the sewage of Brooklyn and Long Island City, has increased, and these cities have been continually paying the penalty in death certificates.

Nor is this all by any means. For Brooklyn, in particular, the sewage mud flat maintained by the continued discharge of *sewage into the street-dirt filling* of the whilom Bushwick Creek (into which the sewage was formerly discharged), Gowanus "Canal," the combinations of fresh fish and meat markets with the grocery stores, and the storage of stable manure throughout the city, taken in the aggregate, constitute a nuisance even more detrimental to the health of the people than Newtown Creek. These nuisances are subject to the control of, but tolerated by, the city authorities.

THE GREATEST ENGINEERING UNDERTAKING OF TO-DAY, however economic, is an unsanitary crime. Millions of dollars are being expended to make the Mississippi River a huge open sewer, and to add the filth of a great city to the combined filth of a hundred lesser cities. As each adds its share the water for the use of those farther down-stream is more dangerously contaminated and polluted. Economical it may be at one point of view, but at another this waste of nitrogenous compounds is appalling; while, hygienically, it is an outrage, not only against future generations, but against the present generation. Vast sums of money are expended to waste a valuable product that could be utilized on the almost limitless prairies about Chicago, and by the waste the health of millions and of a nation is not only imperilled, but certainly harmed. Nothing could speak more eloquently of the need of a strong governmental organization which should legislate upon and control all such undertakings.

PRACTICAL "QUARANTINE" IN ENGLAND.—Dr. Collingridge, the medical officer for the port of London, states in his half-yearly report that 12,018 vessels were visited by the sanitary inspectors. Of these 10,267 were British, the Scandinavians being second with 674. Cleansing was required in 417 vessels, and structural alteration in 276. The number of persons individually examined by the medical inspectors was 12,514, including passengers and crews. Dr. Collingridge pleads for by-laws to deal with the carrying of offensive car-

goes up and down the river. Unsound food has been seized, including 2328 carcasses of mutton, 16,318 cases of fruit, and 81 cases of eggs.

OVERCROWDED TENEMENTS.—New Yorkers are prone to think that their living apartments are crowded, but the following statistics force the conclusion that Emperor William's capital, Berlin, is not a little tucked up. In Berlin, in 1880, with a population of 1,122,330, there were 478,052 persons living in tenements having but one room that could be heated, or an average of 3.75 inmates to a room ; 302,322 living in tenements possessing but two rooms that could be heated, or an average of 2.23 to a room, and 127,346 in tenements with three rooms that could be heated, or an average of 1.56 to a room. So it appears that 900,000 inhabitants out of 1,100,000, or more than three fourths, have only three rooms that can be heated, and are occupied by an average of 2.51 to a room. There are in Berlin 26,203 houses, divided up into 315,063 tenements. The average rent for a tenement of two rooms is $1.50, the highest being $667 and the lowest $53. One house has been known to hold 437 persons, 170 of them children, divided up into 141 households. There are 23,289 cellar dwellings, containing 100,301 inhabitants, of which dwellings but 1404 were provided with closets. But little over half of Berlin houses are connected with sewers.

THE ABSORPTION OF ODORS BY MILK.—Parville relates some interesting facts upon this subject. If a can of milk is placed near an open vessel containing turpentine, the smell of turpentine is soon communicated to the milk. The same result occurs as regards tobacco, paraffin, asafetida, camphor, and many other strong smelling substances. Milk should also be kept at a distance from every volatile substance, and milk which has stood in sick chambers should never be drunk. The power of milk to disguise the taste of drugs—as potassium iodide, opium, salicylate, etc.—is well known.

IDLENESS is the bane of body and mind, a chief cause not only of melancholy, but of many other diseases ; for the mind is naturally active, and if it be not occupied about some honest business, it sinks into melancholy or meditates mischief, and finally yields to the influence of the devil.

NEW BOOKS AND BOOK REVIEWS.

ANY BOOK reviewed or advertised in THE SANITARIAN costing $1.50 or less will be sent *free* to any present subscriber sending the name of a new subscriber, or to any new subscriber on receipt of the full subscription price sent on his own account; or any book so reviewed or advertised costing more than $1.50 will be sent at a discount of that amount.

CONTRIBUTIONS TO AMERICAN EDUCATIONAL HISTORY. Edited by HERBERT B. ADAMS. Circulars of Information, Bureau of Education, Washington.

No. 14. *The History of Education in Connecticut.* By Bernard C. Steiner, A.M. (Yale), Instructor in History and Ph.D., Johns Hopkins University; Librarian of the Enoch Pratt Free Library of Baltimore.

"Common school education," we learn from this history, began in Connecticut. "Before the stumps of trees had been cleared from the home lots and the houses built to shelter the settlers," the colonists founded what appears to be the first public school system in the world's history, and their descendants have ever since continued to be so zealous in giving all their children a common school education, that a man of Connecticut birth who cannot read and write has long been hard to find.

Only a little more than three years from the time the first English immigrants settled in Quinnipiack (New Haven), in 1638, the general court, on Christmas Day, 1641, voted "thatt a free schoole be set up in the towne, and our pastor, Mr. Davenport, together with the magistrates, shall consider whatt yearly allowance is meet to be given to itt out of the common stock of the towne, and also whatt rules and orders are meet to be observed in and about the same."

The pioneers were the Rev. John Davenport and Theophilus Eaton, who were the leaders of this colonial settlement, and the latter its first governor (1638–57). And here compulsory education laws were first enacted, in 1650, requiring all the families of the colony themselves to teach, or have others

teach, their children and apprentices for them, "so much Learning as may inable them perfectly to read the Inglish tounge, and knowledge of the Capital Lawes," under penalty of twenty shillings for each neglect so to do.

The colony of Hartford appears to have been contemporary with that of New Haven in its educational provision, excepting compulsory laws. In 1642 the voters appropriated "thirty pounds a year to the town school," and in February, 1648, "for better conveniency than hitherto hath been attained for the keeping of a school, . . . a school-house is to be built at Hartford, and is not to be devoted to any other use or employment." Other towns followed suit. In 1662 the colonies of New Haven and Hartford were united under the Winthrop charter of Connecticut. But even before this, grammar schools, high schools, and academies had begun to be established. And to have a college in New Haven is said to have been part of the original plan of Davenport as early as 1647, and in 1652 an attempt was made to found it. Moreover, in connection with this beginning of education—as described in the first chapter of the monograph—it is interesting to observe that the first book written and published by a native of Connecticut was "The Accidence in Questions and Answers," London, 1683, by Rev. Samuel Hoadley, born at Guilford, September 30th, 1643. This school-book went through a number of editions.

After the charter of 1662 the policy of the colony, later the State, toward education in general is briefly traced, outlining the different systems of management and the different stages of the old free school, of the academy, and of the modern high school. Next follows a sketch of the more prominent institutions of secondary education; among them the old foundations of Governor Hopkins in New Haven and Hartford, the Norwich Free Academy, the county Latin schools, grammar schools, common town schools. The Indians, too, were the subject of consideration. The Code of 1650 provided for their religious instruction, and four years later the court ordered that a native Pequot should be maintained and educated "to the end hee may be for the present assistance to elders and others to interpret the things of God to y^{m} as he shall be directed." No laws were made by New Haven for

the education of the Indians; but the Rev. Abraham Pierson, of Branford, learned their language and preached to them, and the commissioners of the united colonies granted money for their education in New Haven. From this beginning follows an account of the subsequent steps taken for the education of the Indians. Next follows a sketch of the educational policy of Connecticut as a State, 1776–1890, and a description of school societies.

The history of Yale College and University is given with great particularity, illustrated by photo-engravings of the chief buildings, from the time of its foundation (1701) to 1893, taking up more than half of the monograph of three hundred pages. Sixty-four pages are devoted to Trinity College, Wesleyan University, and Unattached Professional Schools—the Litchfield Law School, Hartford Theological Seminary, and the Berkeley Divinity Schools. And of the first named of these, Yale is credited with the parentage, "as one of the ablest members (of the Episcopal Church of Connecticut) admits (it) had, one may almost say, been born in the library of Yale College. . . . It virtually began with the change of faith of Rector Cutler and his associates in 1772."

The description which follows, however, shows that the first steps for its establishment were taken in 1788, under the auspices of Bishop Seabury. Its steps are traced through "Seabury College" at Cheshire, chartered in 1801, "the Episcopal Academy of Connecticut," but without power to confer degrees. Repeated petitions were made to the Legislature during the ten years following to establish an "Episcopal College of Connecticut, with all the powers, privileges, and immunities of a college," but uniformly rejected. Indeed, the headway for such an institution appears to have been effectually blocked until after the disestablishment of the Congregational Church by the new Constitution in 1818. Petition to the Legislature was renewed, and the request granted in 1823, and a charter to Washington College was granted. "It required that the college should be conducted on the broad principles of religious liberty," and about one third of the first trustees were not Episcopalians. Nevertheless, a battle of pamphlets followed. Though Congregationalism was no longer the State Church, Yale College was its educational bat-

tlement. From its viewpoint Washington College was "an instrument of sectarian aggrandizement," a "scheme fraught with the seeds of discord," and that it would entail on distant generations a source of implacable feuds and jealousies." A second college was declared to be not only unnecessary, but even to be injurious to the first, and "Washington College could rise into distinction and usefulness only by depressing Yale to the same extent." But its friends pressed on, obstacles were surmounted, jealousies abated, and controversy ended. In 1845 the name was changed to Trinity College, to avoid confusion arising from the fact that there were other Washington Colleges in the United States, and "to attest forever the faith of its founders and their zeal for the perpetual glory and honor of the one, holy and undivided Trinity."

As of Yale, but proportional with its shorter life, its progress is lucidly sketched, and its main buildings and grounds beautifully illustrated.

The Wesleyan University, at Middletown, was chartered in 1831. The promoters of this institution happily fell upon the easy acquisition of the site and buildings of the American Literary, Scientific, and Military Academy, founded by Captain Alden Partridge in 1824, which, not proving successful, was vacated in 1829. The trustees of the old academy donated the buildings and nearly fifteen acres of land to the Methodists, on the sole condition that they be used forever for a college, and that $40,000 for endowment be first raised. This proposition was accepted and the endowment speedily raised.

The Wesleyan University was opened September 21st, 1831, and is the oldest Methodist college in America. It has from the first held high rank among American colleges. During recent years it has received many valuable gifts. The late Daniel Ayres, M.D., of Brooklyn, left the Wesleyan as a student without graduating there, because it was not equipped to give the students sufficiently advanced instruction in natural science. He resolved, if ever the opportunity came, he would remedy that deficiency; and so, in April, 1889, he gave $25,000 to endow a professorship of biology; and in October of the same year he deeded to the university eighty-six acres of land, valued at $30,000, for the same purpose.

In the year ending June 20th, 1889, the real estate of the university was valued at $400,000, its personal property at $109,630, and its resources at $698,556.45. Its site is said to be the most beautiful of the three colleges of Connecticut. The engravings of it and the buildings which illustrate the description justify the statement.

No. 15. *The History of Education in Delaware*, by Lyman P. Powell, A.B., Fellow in the Wharton School of Finance and Economy at the University of Pennsylvania, and Staff Lecturer on History to the American Society for the Extension of University Teaching. Pp. 186.

The first four chapters of this monograph treat of the colonial period, and locate the genesis of education at the middle of the seventeenth century. They show that the Swedish, Dutch, and English settlers established schools in conjunction with churches, and either employed professional school-masters or bestowed upon one person the functions of school-master, pastor, parson, chorister, bell-ringer, and, among the Dutch, comforters of the sick.

Next follows a description of education in the towns from their foundation to the present time. Among them two academies are particularly notable—the Wilmington Conference Academy, established in 1873, has been the centre of Peninsular Methodism, and the largest as well as the most flourishing school in the State; Newark Academy, which was established in 1767 at New London, Pa., by Francis Alison, was removed to Newark in 1767, and has maintained an almost continuous existence ever since. Of those who had been its students, four became signers of the Declaration of Independence, four congressmen, four governors of States, and many prominent characters of the Revolution.

The next chapter treats of the Delaware College. Its history is full of interesting facts, showing the straits to which its projectors were put in their efforts to establish it. After numerous appeals to the Legislature had been successively rejected, an act was passed in 1818 to enable the trustees of Newark Academy to raise $50,000 by a lottery for the purpose of erecting and establishing a college in Newark. This act was supplemented from time to time, and finally "Newark College" was established under a charter granted February

5th, 1833, and buildings were at once erected. A notable feature of the charter was the names of some of the trustees—John M. Clayton, Louis McLane, Richard H. Bayard, and Henry M. Ridgely—men particularly prominent in State affairs and of celebrity abroad. Many famous men have since served among the trustees and professors of this institution.

Next follows an account of the origin and progress of public education in the State from 1796 to the present time. One of the most interesting features being the "Delaware Association for the Education of Colored People," organized in 1867, and the unremunerated though untiring services of Henry C. Conrad. The reader who would appreciate the continuous struggle for educational privileges in Delaware must ever bear in mind the problem of geographical situation. The position of Delaware, between States north and south having excellent schools, has permitted her children to be captivated by advantages she has not been able to offer.

No. 16. *Higher Education in Tennessee*, by Lucius Salisbury Merriam, Ph.D., sometime Fellow in Political Economy in Johns Hopkins University; Instructor in Political Economy in Cornell University.

The first two pages of this monograph of 287 pages are devoted to a biographical sketch of the author, who was drowned in Cayuga Lake, near Ithaca, N. Y., November 18th, 1893. The proof sheets of this report were read by him early in the preceding summer.

Happily for Tennessee, she has been made the custodian of the higher educational privileges by the United States and private benefactions.

In 1806, conformably to the spirit in which North Carolina had ceded and the United States had accepted the territory afterward known as Tennessee, Congress appropriated 100,000 acres of public land in Tennessee to two colleges, one to be established in the eastern, the other in the western part of the State. The same act also appropriated 200,000 acres of land for academies and schools of a lower grade.

East Tennessee College, at Knoxville, chartered for the purpose and united with Blount College and Cumberland College at Nashville, chartered on the foundation of Davidson Academy, secured the grants for colleges.

The Peabody Normal College rests on the foundation of the old University of Nashville, enjoying the use of the plant and endowment, and is further supported and fostered by the State and by the Peabody Education Fund. That it bids fair to fall heir to that immense fund lends an added interest to the already interesting history of the University of Nashville. For a quarter of a century this institution was raised by Philip Lindsley to a position of paramount influence in Tennessee and the Southwest. Free from the dominion of any religious sect, and situated in the capital city of the State, the University of Nashville stood for Tennessee in her entirety as perhaps no other college has ever done. The University of Tennessee, West Tennessee College, and the University of Nashville are the only prominent colleges in the history of the State that are not denominational.

The Baptists have their Carson and Newman College, and their Southwestern Baptist University; the Northern Methodists their U. S. Grant University; the Southern Methodists their Hiwassee College and their Vanderbilt University; the Cumberland Presbyterians their Bethel College and their Cumberland University; the Northern Presbyterians their Greenville and Tusculum College, their Maryville College, and their Washington College; the Southern Presbyterians their King College and their Southwestern Presbyterian University; the Episcopalians their University of the South; the Roman Catholics their Christian Brotherhood College, etc. And, besides these, there are colleges exclusively for the education of negroes—Fisk University, Roger Williams University, Central Tennessee College, and Knoxville College—all established since the war; and these, like the rest, have been established almost wholly by individual endowments or by the combined efforts of their churches in several States or parts of States independent of Tennessee. The description of them in detail, with numerous illustrations of the sites and buildings, cannot fail to be of interest to a multitude of readers.

No. 17. *Higher Education in Iowa.* By Leonard F. Parker, Professor of History in Iowa College.

The first school within the limits of Iowa was opened less than sixty years ago. But from the extracts of several letters

by old settlers, published in this monograph, it is interesting to know that schools were taught in the territory, before Iowa had an independent organization, in 1838. There were three governors in Iowa Territory during the eight years of territorial existence, the first of whom was Robert Lucas, from 1838–41, who, in his first message to the Legislature in November, 1838, urged attention to the third article of the ordinance establishing the Territory, which declares "That religion, morality, and *knowledge* being necessary to good government and the happiness of mankind, *schools* and all the means of education shall be forever encouraged." Congress having granted one section of land to the inhabitants of each township for the purposes of schools therein, he urged "the subject of establishing at the commencement of our political existence a well-digested system of common schools," and recommended the organization of townships, without which it would be impracticable to establish a regular school system. This was the key-note to subsequent but dilatory action by the Legislature promotive of education. The people, however, did not wait for legislation nor depend upon it. "During the territorial period a goodly number of academies and seminaries were incorporated, but it has been said that 'it would require an antiquarian, with his compass and chain, at this date to find some of those seats of learning of fifty years ago. Some of them, like Jonah's gourd, came up at night, flourished for a season—a very brief one—and withered with the rising of the sun.' Some of them survived until graded and high schools deprived them of patronage. One, and only one, of these still lives—Denmark Academy."

The history of popular education in the State is divided into two periods, the one before and the other after the adoption of "the township school system" in 1858—the period of "getting under way." It was rather heterogeneous, but resulted in a tolerably good new school law. The provisions are quoted and analyzed.

In 1876 the General Assembly enacted that "no person shall be deemed ineligible by reason of sex to any school office in the State. Since that time several women have been elected school directors and county superintendents. Opposition to this law, or to such a choice for school officers, if it exists, is unspoken."

Several high schools have been established equal to low-grade colleges. Teachers anticipated the action of the State in providing for the instruction of teachers by conventions and the establishment of teachers' institutes as early as 1849, since which time normal and training schools have become common in various parts of the State.

Highland Park Normal College, in Des Moines, and the campus comprises ten acres. It was opened September 2d, 1890, and over three hundred students were soon enrolled. It appears to be one of the best-equipped institutions of the kind in the United States.

The State Agricultural College, founded on the national land grant of 1862, is described in full, and exhibits thoroughly successful operation. Next follows the history of the State University, located at Iowa City, founded, for the most part, from funds obtained by the sale of the land grant for the purpose by the National Government in 1840. The first attempt to organize the University proper was made in 1854. The description in detail which follows—the difficulties encountered by the trustees, how they were overcome, the final success of their efforts, the excellent equipment and the present prosperous condition of the university—is an admirable lesson for those who would engage in like enterprise for coming States.

Private Secondary Schools, Denominational Colleges, the Higher Education of Women in Iowa, and Educational Auxiliaries follow in successive chapters. The whole monograph of one hundred and ninety pages, with numerous illustrations showing the beauty of the buildings and their sites, is eminently creditable to the author and to the educational enterprise of the State.

CONTEMPORARY LITERATURE.

THE TRANSFORMATION OF RURAL NEW ENGLAND.

A QUARTER of a century ago the residents of the north shore of Massachusetts Bay—to which no self-respecting Bostonian nowadays ever dreams of alluding otherwise than as

the "North Shore"—differed little from those on the remainder of the much-broken New England coast-line. If you seek the pioneer in the modern movement you must go to Mr. Grant for information. I shall tell you only how by degrees the busy American began to appreciate that "all work and no play makes Jack a dull boy," and gradually to stop for a breathing-spell. And thus, one at a time, slowly at first, the value of wholesome air and a bit of relaxation made converts. Slowly the underestimated farms passed from rustic to urban ownership, and became at once the most economical and best sanitariums in America, while the erstwhile proprietors withdrew farther into the New England fastnesses. Gradually, too, the entire scene changed from the up-at-sunrise-to-bed-at-sunset monotony of the simple-minded country folk to the brisk atmosphere of refined people; Nature herself seemed to welcome the more congenial surroundings, and the country assumed a brightened aspect. Where the leg-weary family hack, silhouetted against the autumn sky, had toiled over the hills to the solitary cross-roads store, the village cart now dashed along, drawn by a good-blooded horse, and driven by a fashionably gowned woman. Man and womankind improved in health, horseflesh in quality, and we began to learn how to use to advantage our opportunities for recreation and health.—*From "Evolution of the Country Club," by Caspar W. Whitney, in Harper's Magazine for December.*

A PLEASANT DEBT WE OWE TO DR. HOLMES.

Among the titles of Dr. Holmes to gratitude and enduring remembrance, which recall themselves to us so numerously and forcibly at the moment of his death, there is one which I hope no one will lose sight of, and which perhaps ought to be called his influence as a civilizer. He not only showed us, it seems to me—and I am thinking of some of his more didactic poems, of the opening chapters of "Elsie Venner," of countless passages in the "Autocrat" and the "Professor"—what a fine foundation we Americans have to build upon, but he was the means of inciting directly a multitude of readers to work toward ideals of real and sincere culture (not the sham article) which have never in our literature been put into such sane and comprehensive form. I should like to see a

muster, and I am sure it would be a large one, of the men now in middle age whose mental tone has been, consciously or unconsciously, considerably influenced by the kindly castigation, until they seemed intolerable, of shams and half-baked pretences that otherwise they might have gone on tolerating; by the flashes of unmalignant wit in which even small boorishnesses and meannesses were suddenly shown up in so unmistakable a light that it seemed impossible ever to commit them again; by the numberless cumulative touches by which an ideal of the gentleman was built up, wholesome, sensible, unpriggish, attainable by every sincere sham-hating man, yet also full of quiet high things, charity, consideration for others —a "man of gentle will."—*From "The Point of View," in the Christmas number (December) of Scribner's Magazine.*

THE *North American Review* for December contains two particularly interesting articles under the title of "Two Great Authors," critically reviewing the works of JAMES ANTHONY FROUDE and OLIVER WENDELL HOLMES, written respectively by Professor Goldwin Smith and Senator Henry Cabot Lodge.

THE SECRET OF DR. HOLMES'S SUCCESS.

Dr. Holmes owed his success to his own gifts and to their wise use, but he also, in large measure, owed the happiness which he both enjoyed and imparted to his cheerful philosophy and to his wide, eager, and quick sympathies with all that touched mankind. He was in one respect a very rare combination. He had the scientific mind and at the same time he was a poet and novelist. As a physician, and as a lecturer for many years upon anatomy, he won distinction and success, and every form of scientific thought and inquiry had for him always strong attractions. He could think and could impart his knowledge with the precision and accuracy which science demands. Yet, with this strongly marked habit of mind were joined a lively imagination, the power to body forth the shapes of things unknown, and a most delicate fancy. These mental qualities in a high degree of excellence are rarely found together. Instances have not been wanting, like Sir Thomas Browne, for example, of men of scientific profession and train-

ing who had likewise great literary gifts, and who, as observers, thinkers, and writers, take high rank. But this is something very different from the genius of the poet and romancer. The creative imagination and the scientific cast of thought, joined as they were in Dr. Holmes, imply an extraordinary flexibility and versatility of mind. In his case, too, the mingling of the different elements never affected either injuriously. Imagination did not make his medicine or anatomy untrustworthy, nor did his scientific tendencies make either his verse or his prose cold or dry. His wit and humor, it is true, gleamed through his lectures and left behind them to a generation of students a harvest of stories and traditions. The scientific cast of thought, on the other hand, as it often supplied an image or a metaphor, may possibly have had something to do also with the unfailing correctness of the poet's verse. Certain at least it is that the unusual combination of these widely differing qualities of mind was no less remarkable than the fact that they never jarred upon each other and never warped the life's work in either direction.— *From "Dr. Holmes," by Senator Henry Cabot Lodge, in North American Review for December.*

THE *Review of Reviews* for December brings to the attention of its readers a remarkable state of things in South American international relations. It has been known for years that Great Britain has persistently encroached on territory belonging to the little republic of Venezuela; but few Americans have been aware of the extent of those encroachments. The editor of the *Review of Reviews* asserts that England is now occupying a vast region which only a few years ago she acknowledged to belong to Venezuela, and that in fact she has no lawful claim to any territory whatever west of the Essequibo River, although she has acquired the coast line as far west as the Orinoco. The editor's charges seem to be supported by the statements of reliable English publications; the Cyclopædia of Geography, for example, computed the area of British Guiana a few years ago as 50,000 square miles, while the present area is given as 109,000 square miles by all British statistical works, although there have been no cessions to England in that region. As Great Britain has refused

arbitration of the points in dispute, the *Review of Reviews* advocates the appointment of a joint commission by the United States, Mexico, and the South American republics to investigate Venezuela's claims, and that such as may appear well founded be sustained by the united American powers against England.

THE BICYCLE FOR WOMEN.

The mention of the bicycle for women opens a field of mild controversy which is only important because some of the objections to its use are taken from the hygienic standpoint as well as from the social. Many objectors contend that the wheel is as undesirable for women as the sewing-machine, while the majority of parents seriously object to what they feel to be the unpleasant publicity of the exercise. As a matter of health, which is of the first importance, the writer has made many inquiries among women who use the wheel regarding the effects of the exercise upon them, and has failed to discover a single case of injury or poor health resulting from its use. On the contrary, the testimony to its exhilarating and healthful effect is universal. Several other American physicians, qualified to speak from experience in their practice among women, have warmly commended its use. From the standpoint of a symmetrical exercise, the position is preferable to that on a horse. The movement is unlike that of the sewing-machine in several important respects: Instead of being bowed over in a cramped position which restricts the action of lungs, digestive and pelvic organs alike, the woman rider sits erect, with full opportunity for chest expansion, while the difference between the environment of the sewing woman and the riding woman as regards indoor and out-of-door life is most important.—*From "Athletics for City Girls," by Dr. Mary T. Bissell, in The Popular Science Monthly for December.*

THE CHRISTMAS *Century* is distinguished by a new and artistic cover printed in colors. Its high-lights are Napoleon, Christmas, ten stories (including Rudyard Kipling's first American story), Cole's engravings, and Castaigne's drawings. There are in all forty-six illustrations, of which twenty-five are of full-page size, including nine with special reference to

either the religious or the domestic aspect of the season. Among the artists whose work is reproduced are the great Van Dyck (three beautiful wood-cuts by the engraver T. Cole), André Castaigne (five drawings), Dagnan-Bouveret, Eric Pape, Otto H. Bacher, J. F. Burns, Bounieu, Dalou, Guipon, Kenneth Frazier, Irving R. Wiles, Scheurenberg, Von Uhde, Wenzell, Howard Helmick, and F. S. Church. Among the contributors are Rudyard Kipling, Marion Crawford, Sarah Orne Jewett, Mrs. Burton Harrison, George Parsons Lathrop, Ruth McEnery Stuart, William M. Sloane. Professor Sloane's contribution is the second part of the Life of Napoleon, and deals with Napoleon at the beginning of the Revolution, his private studies, and garrison life ; his attempts at authorship ; the outbreak of the Revolution, its effects on Corsica and on Bonaparte's relation to France, his first lessons in Revolution, and his traits of character.

LONG-LIVED AMERICANS.

This Western hemisphere has many sorts of climates, but they all have in common this encouragement, in exceptional cases it is true, to great age. It has been supposed that the exceedingly variable and violent climate of some regions of our country is hostile to long life. But if we study the matter in view of multitudes of instances, we see that it is not climate, or even hardship, that shortens life in the United States, for instance, but that it is worry and care, or, in other words, the furious pace at which we try to live. No attempt is made to defend the climate of New England, and yet the number of people who have attained a great age in it is positive proof that the climate is not altogether in fault for mortality. It is probable that the record would be very different if we had paid as much unworried attention to growing old as we have to fighting Indians, subduing forests, making money, and getting ahead of our neighbors. We are still as a nation very young. some physical conditions have been against us, and there has not yet been time enough to spare to show what the country can do for us in the way of longevity. In New England they are less than three lives from the landing of the Pilgrims. Among the Pilgrim records at Plymouth is a letter from Peregrine White, who was born on the *Mayflower* when

it lay in Provincetown—the first white child born in New England. Following that is a letter from an estimable Pilgrim deacon, who lived to be 106 years old, and who testifies that he knew Peregrine White. Following that is a letter from a lady still living, at the age of ninety-two, who says that she remembers the aged deacon of 106 years. Thus less than three lives take us back to the Landing and to the Rock, which is almost as mysterious as the aerolite, or black stone, in the Kaaba at Mecca, since it is like no other piece of granite on the Massachusetts coast. It may be mortifying to see that we have no greater antiquity than this, but the efforts of three persons to cover it is encouraging.

But it is in other regions of the continent that we must at present look for the extraordinary capacity of the New World for producing old people. Well-authenticated are cases of mission Indians in Southern California who reached the ages of 120, 130, and 140. In that equable region all the great functions of nature go on with regularity, so as to induce a long running of the machine. But besides this, these old men were probably free from care, from religious doubts and scepticism and political worry and ambition, and it is testified that they were simple in their habits, temperate, and even abstemious, drinking only water, and eating little but corn, which they fitted for digestion by the vigorous action of their own grinders. Lieutenant Gibbons found in a village in Peru one hundred persons over the age of 100, and either he or another credible explorer there reports another man aged 140. He was a very temperate man, ate his food cold, and never ate meat except in the middle of the day. In the highlands of South America the habit of old age is a long-established one. In Ecuador centenarians are common. The census of 1864 found in the town of Pilaguin, 11,000 feet above sea-level, about 2000 inhabitants, among whom were one hundred over 70 years of age, thirty about 80, eleven over 90, five over 100, and one who was 115. Not many years ago died in Ambato a woman named N. Cucalou, who was 114, and one Don José Soto, aged 120. In the year 1840, in the town of Baños, died old Morales, a vigorous carpenter to the end of his life, who was well on in years and the steward of the Jesuits when they were expelled from their property in 1767. In 1838 a

witness in a judicial trial was proved to be 140 years old, having been born on the night of the great earthquake which destroyed the old town of Ambato in 1698. How much longer this man lived, who was cradled by an earthquake, is not yet reported. Mexico, notwithstanding its revolutions, is equally favorable to longevity. In the state of Vera Cruz there died a man in 1893 who was 137 years old. That he was carried off prematurely we have reason to suppose, for at Teluca, where the register is officially and carefully kept, there died only a few years ago a man aged 192.—*From the "Editor's Study," by Charles Dudley Warner, in Harper's Magazine for December.*

PRACTICAL SANITATION.—The Baroness Burdett-Coutts, at the age of twenty-three, found herself the richest woman in England. She visited some of the foulest dens in London with Dickens, and, as a result of these visits, she converted Nova Scotia gardens into Columbia Square, with its model tenement-houses. During the cholera epidemic of 1867, she employed eight trained nurses, two sanitary inspectors, and four disinfectant agents to work under a doctor in the East End. She has founded the bishoprics of Adelaide, British Columbia, and Cape Town, at a cost of about $250,000 apiece. She spent $500,000 in building the church of St. Stephen at Westminster. She started the Whitelands Training College, and is the chief promoter of the English Society for the Prevention of Cruelty to Children. She is President of the Destitute Dinner Society, of London, which every year gives 300,000 substantial dinners at a charge of from a half-penny to a penny each.—*The Living Church.*

THE CAUSES OF EPIDEMICS.—In a lecture given recently to the Halifax Scientific Society, Dr. Solomon Smith drew attention to the fact that to produce an epidemic prevalence of any disease the co-operation of many causes was necessary. These factors might be grouped as :

1. Those which increased the susceptibility of individuals, about which we knew but little.

2. Those which favored the outside growth and development of the infection—heat, moisture, organic impurity of soil and water, aeration of soil, etc.

3. Those which favored the fouling of the water, floods or droughts, according to circumstances, varying level of subsoil water, construction of wells, tanks, and water supplies, their relation to cesspools, and surface pollutions, and social habits of the people by which such pollution was encouraged and carelessness as to drinking foul water induced.

4. Those by which the infection was transmitted from place to place, especially movements of large masses of people, as in pilgrimages and wars, and the rapid distribution of cholera-infected people over large areas in some part or other of which a suitable nidus for fresh growth of the infection would be likely to be found.

Cholera was, no doubt, continually being exported from its home in India; but it only occasionally became epidemic in those places where it was an exotic, and when this happened we must look for an explanation not merely to water carriage, which was the mere mechanism of its spread, but to a coincidence of those varied and complex causes which assisted in the intensification of the disease. To some extent the production of an epidemic was analogous to the opening of a "word" lock. As all the letters must be placed in position before the lock could be opened, so many factors must combine before an epidemic of cholera could be caused. The converse of this, however, was also true, and on this was founded our protection from cholera, for however little we might know with precision about some of the multiplex causes of a cholera epidemic, we did know that one essential cause, one letter to the lock, was the swallowing of the poison, and thus by a provision of pure water we were able to break up the combination by which alone an epidemic could be produced.—*British Medical Journal.*

THE KEELEY CURE AND THE RELIGIOUS PRESS.—*The Christian Advocate* of New York has undertaken the task of determining by a systematic method the value, if any, of the so-called "Keeley Cure" for inebriates. That the "gold cure" partakes of the characteristics of a base fraud is well known to the medical profession. The public is deceived by cunning advertisements, and the religious press has been especially sought by quacks and nostrum venders as a means of

reaching a large class of intelligent, but credulous people. The editors of the *Advocate* deserve much credit for the work they have undertaken. The following quotation is sufficient apology for the critical investigation which it proposes to make: "The public has often been assured that 95 per cent of all Keeley graduates are 'cured' or 'reformed.' We know of the Keeley 'graduates' we have met four who have relapsed, two who have committed suicide, and others who are in asylums, making more than 50 per cent of the small number that we know." Reports from physicians and ministers are desired as follows:

"How many do you *know* who have taken the Keeley treatment?

"Of those who have taken it, how many have remained sober and totally abstinent for a period of nine months or more?

"How many have relapsed in less than that time, or have committed suicide, or become insane, or have been physically seriously injured by the treatment?

"We wish no information from managers or agents of 'Keeley cures' or graduates thereof. The information must be first-handed and confined to the Keeley cures."

SCIENCE.

The weekly journal *Science* will be published after January 1st, under the direction of an editorial committee in which each of the sciences is represented by a man of science who is at the head of his department. The committee is constituted as follows: *Mathematics*, Professor S. Newcomb (Johns Hopkins University and Washington); *Mechanics*, Professor R. S. Woodward (Columbia College); *Physics*, Professor T. C. Mendenhall (Worcester); *Astronomy*, Professor E. C. Pickering (Harvard University); *Chemistry*, Professor Ira Remsen (Johns Hopkins University); *Geology*, Professor J. Le Conte (University of California); *Physiography*, Professor W. M. Davis (Harvard University); *Paleontology*, Professor O. C. Marsh (Yale University); *Zoölogy*, Professor W. K. Brooks (Johns Hopkins University), Dr. C. Hart Merriam (Washington); *Botany*, Professor N. L. Britton (Columbia College); *Physiology*, Professor H. P. Bowditch (Harvard University); *Hygiene*, Dr. J. S. Billings (Washington); *Anthropology*, Pro-

fessor D. G. Brinton (University of Pennsylvania), Major J. W. Powell (Washington); *Psychology*, Professor Cattell (Columbia College). This committee assures a high scientific standard and wide field of usefulness to the journal.

THE COLORADO CLIMATOLOGIST is a new monthly periodical, the first number of which is before us—for November, 1894. It contains twenty-eight textual pages, well filled with contributions on Medical Education in Denver, by William P. Munn, M.D.; The Ways and Means of Preventing Infection from Tuberculosis, by Carl Ruedi, M.D.; What is Tuberculosis? by Charles Denison, M.D.; Colds, by F. E. Waxham, M.D., and Editorial Summary. $2.00 a year; 25 cents a number. All communications should be addressed to CHARLES MANLY, M.D., South Denver, Col.

SANITARY PATENTS OF RECENT DATE.

Obstetrical Stirrup. J. M. Maurer, Washington, Pa. 529,626. Has a fixed and a movable jaw, a plate carried by said movable jaw, and means for adjusting this plate vertically.

Surgical Chair. A. P. Gould, Canton, O. 529,902. This chair is of such construction that it can readily be adjusted to any position and at any angle. Can be used very easily as an operating table.

Inhaler. S. D. Ross, Manhattan, Kan. 529,808. A shell and medicine holder, consisting of a pair of perforated plates and a hollow standard to which they are secured, and a swinging valve pivoted to one of said plates and adapted to close the opening in the standard.

Insecticide. L. & E. Brumleu, Cuero, Tex. 530,010. Consists of ferric oxide, arsenious acid, and sulphate of lime.

Ligature Receptacle. G. M. Stratton, Conshohocken, Pa. 529,844.

Oxygen Generator and Holder. G. R. Prowse, Montreal, Can. 530,453.

Surgical Chair. Frank E. Case, Canton, O. 530,159.

Method of Testing Milk. I. K. Lindstrom, Sweden. 531,049. Consists in mixing the milk with a solvent of casein, heating the mixture to the melting point of the fat, subjecting the mixture to centrifugal action, and finally solidifying the fat by cooling it with cold water while the mixture is under centrifugal action.

THE SANITARIAN.

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THE ECONOMICAL AND EFFICIENT DISPOSAL OF THE HOUSEHOLD GARBAGE OF NEW YORK.

A CONJOINT ESSAY.*

By DRS. THOMAS H. MANLEY and DOUGLAS H. STEWART, of New York.

PART II.

THE DISPOSAL OF HOUSEHOLD GARBAGE has a past, a present, and a future. The past has been at times disgraceful, the present is unsatisfactory, and the future needs great reforms to put it on a par with the present of many small towns.

New York is one of very few cities, if not the only one, that requires its Street Cleaning Department to manage its garbage, all the others placing this matter in the hands of the Health Board. Even that organization, composed, it is presumed, of men well versed in sanitary and hygienic theory and practice, has struggled with the problem until we hear it referred to as "the nightmare of the health officer's dream," "the terror of the sanitary man," "the vexatious, the irrepressible, the never-to-be-solved, overcome, or settled question," "the squared circle of city life." These and other expressions coming from specialists—to use a term of the day, from men who have devoted hours and years of unwearied mental and physical endeavor—give us a great respect for the intricacies and difficulties of the subject, and convince us of the absurdity of placing this important factor of city civilization in the hands of shovellers and sweepers whose overseers make no claim to knowledge of any sort on the disposal of

* Read at a meeting of the Section on Public Health, New York Academy of Medicine, December 5th, 1894.—Continued from page 10.

garbage beyond the mere handling, following directly in the paths planned and obeying the laws laid down by the city fathers when New York was possibly one third of its present size, and the cities round about the harbor were very small indeed compared with their dimensions to-day, the very head of the department owing his position to an influence derived from his political affiliations rather than from his judgment and experience in this line of work. Consider him for one moment—a man holding office only for such time and on such tenure as politics afford. He may be honest, persevering, and earnest, but neither fitted by training or education to deal with modern ideas and methods. Can you expect him to be effective?

Remember, this garbage has been the Waterloo of hard-working, conscientious men with good intentions; who have come, have seen, and have been utterly conquered by it. The trouble must certainly lie somewhere in the system, not in the men. One of the first steps I suggest is to keep up to the times and put the disposal of household waste into the hands of the Health Department, or else make an entirely new and separate body, to be called the New York Refuse Department or any other name that seems appropriate. Give this body power to make contracts. Let it have a responsible and capable head, not liable to needless changes, but with able assistants, who may hold their positions as long as their services are satisfactory. Let these men dispose of house refuse, and leave the Street Cleaning Department to its own proper duties.

Let each man, or gang of men, have an appointed district and definite work, because no conglomeration of men to sweep dust, empty ash barrels, and shovel snow here, there, and everywhere, can give satisfactory results.

This plan has been so long and so thoroughly tried that when one wishes to obtain a few points as to the present scientific treatment of swill, one must leave the chief commercial centre of this hemisphere and go to a little New Jersey town of less than one hundred thousand inhabitants. This hurts the pride which every New Yorker feels in his city; and I am sure every inhabitant wishes for the time when New York shall have the best, and shall present a shining example

to the world of how to do it, not, as now, a well-marked dirt spot; and such an evidence of how not to do it, insomuch that a visitor describing it said: "New York is a hog trough between two sewers." When we glance backward for a moment at the condition of our streets as we saw them in the snowy part of last winter, and consider where an improvement can be advantageously made, bearing in mind that the scope laid out only deals with the household and its waste—when we remember that time when for days every available box, barrel, and pail were filled with the overflow that could not be moved, when newspapers, public and pulpit, were asking the reason of the accumulation, the only reply to complaints at headquarters was, "The scows could not go to sea." We can recall the curbstones of both sides of the street presenting to our eyes lateral rows of barrels, tin pails, rusty iron kegs, and old butter firkins, each with a definite and overpowering odor, with their uncovered contents presenting a reeking, foul mass, especially offensive when the warm sun partially thawed them. Often each vessel was topped with an overflowing mound, whose pinnacle was scattered over the clothing and into the eyes of the citizen, or sifted over the sidewalk and street by every passing gust of wind. At the root of the matter were always the scows.

Dr. Manley has pointed out in no uncertain tones that garbage and ashes should be kept distinctly apart. Here he has taken a long and decided step in the march of progress, because the garbage, representing only 20 per cent of the whole material to be moved, could be taken away in case of an unprecedented snow blockade, while the ashes and junk, being a non-putrefiable, inoffensive eighty per cent, could be left in the cellars until the blockade was broken, and then additional labor could move the accumulation in a few days. In all ordinary times we should be able readily to dispose of both. In an emergency the labor could be lightened by four fifths for a time, and at such a season all putrefaction would be slowed or arrested by low temperature. With the present *régime* there is no relief, winter or summer—the ashes being worse in winter, from our furnaces; the garbage more abundant in summer, from our fruits and vegetables; and there is always the block at the scows in rough weather. The law for-

bidding the filling of ash or garbage cans higher than to within four inches of the top is practically a dead letter, but if enforced it would surely be a great help in preventing the scattering due to wind. It is evidently better to increase the number of containers to each house than to overload a single one; better to have several easily moved, partially filled refuse barrels than to have but one that cannot be lifted without spilling. The galvanized iron can, I am very glad to say, is becoming more and more common. Those of us who remember when the wooden barrel was universal call to mind also the small boy who upset the ashes into the gutter and took the barrel for his election celebration. It mattered not whether Democrat or Republican was elected, the fire was always in evidence; and then, too, the gamin was ever with us, forced by necessity to collect our barrels for firewood. These and other considerations have led to the use of metal receptacles, which are stronger, more cleanly, smaller, and more easily manipulated than their predecessors, the handles on the sides affording a better grip and ensuring their more accurate emptying. They are rarely or never covered. We are expected to keep our ash cans and garbage within the stoop line; but the carrier has never come to my door who would collect it without his monthly remembrancer; and when the tip was given, my barrels went without scrutiny; but woe to those neighbors who forgot the driver. Of course, according to a New York habit, the easiest way was taken, and those people who preferred having the front walk clear and free from objects not at all pleasant to contemplate left the garbage under the stoop and silvered the dust man, who has removed ashes that have contained almost every part of the human anatomy, including the placenta. Upon the avenues, the waiting barrels are still too numerous, though for the most part they have retired from view before the private houses. Yet a careful scrutiny will reveal certain portions of our city where they are plenty and putrid.

Many of our carts are now boiler iron with no covers, except a delusion and snare in the shape of a more or less foul piece of canvas just large enough to cover the top of the cart, with the exception of about one foot at the rear end, making excellent provision for keeping the dust off the driver and en-

suring any overload being shaken out over the tailboard and trailed along the highway. This cart frequently leaves our doorstep well heaped up, but always arrives at the dump level or below a level with the top edge. Surely no one will imagine that the partial covering of cloth will serve to retain gaseous products of decomposition. If you will watch the cart at the dump you will see that no precautions are taken for cleanliness—at least, I have never seen anything more than a very superficial scraping with a stick or shovel after dumping. The usual process is to return to work with foul lumps sticking to the sides and bottom, and the empty cart smelling quite as bad as a full one. At the dump are the scows, lending their baleful aid to the odors during the slow process of loading. In short, we have a circle consisting of uncovered barrels filled with masses of mixed garbage and ashes, usually two stalwart men bribed to come inside the stoop line and carry out the barrels to a cart at the gutter, the barrel resting, during the emptying, on the edge of the cart, which slopes downward from front to rear in a line well calculated to spill any excess. Most of us have experienced the unpleasant sensation of getting to leeward and being engulfed in a cloud of ashes, while barrel after barrel was emptied into the open cart, which is then driven next door and the process repeated not until the cart is full—for it may be running over—but until it passes out of sight. Finally, what is left is dumped on a scow with the winds constantly at work. When the boat is loaded, perhaps another partial covering is thrown over the heap, with a gap of a foot or two at the bottom to make certain of a constant jettisoning all down the bay. In fair weather the scows are taken to sea and emptied, with the result that much of their cargo comes ashore in a week or ten days, after it is thought to be permanently deposited on the bottom of the deep. We except those occasions when, on a dark night, the load has been dropped just below Castle Garden. With the most favorable conditions examine closely the scows as garbage disposers. On a charming day and smooth sea they reach their off-shore limit. Surely, one would naturally say, that if emptied on an ebb tide the garbage must be carried out farther and the ashes sink ; but those of us who have chanced to walk the shores of Long Island and New Jersey

know better. We have seen the water on the beaches converted into a malodorous, thin soup, with various bodies of dogs and cats, together with decayed vegetables and fruit peelings of every description, floating about. We have already heard the cry from the inhabitants of those coasts: "Come and help to deliver from your garbage." After seeing the results of our treatment I can only wonder that we have not yet heard the war cry, "We are going to deliver ourselves;" but the Americans are a patient folk. I do not believe that, as generally supposed, ashes remain on the bottom until destroyed by attrition or covered with sand. After all, it is only the more solid and less objectionable portions that sink at all, even temporarily, but the odoriferous and detrimental portions float with various currents and eddies for great distances, and may even, as we have seen, be cast on shore again. The life savers know well that coal and other non-buoyant material will be cast upon the beach from vessels foundered a long distance off. When the *Panther* went down off Southampton, coal and heavy wreckage were washed upon the beach below Amagansett, over twenty miles away. In fact, at some of the coast-guard stations all the coal necessary for the needs of the station is picked up right at the doors, drifting ashore along the bottom from sunken colliers. You will find long stretches of beach quite covered with ashes and no habitation near, particularly on Long Island. Where do they come from? Are not the lemon rinds and floating garbage just at hand fingerboards which point to the New York scow as their source?

I have drawn this picture of what our lack of system is at present because I think the scows and sea disposal ought to go. They are quite unmanageable in many summer squalls, and when tied to the docks for safety, the accumulating garbage stews, ferments, and breathes its pestiferous breath into our very windows. It has been supposed that the tides in New York Bay are sufficiently strong to break up whatever stray garbage falls into them; but the tides in the Thames are nearly ten feet higher, or considerably more than double, and yet before the advent of the present system it has been completely blocked up by sewage. Our harbor has all it can do to dispose of sewage, which, pouring out at ebb and flood,

must be carried up and down until macerated, broken up, and precipitated. Only those who have watched a dredge at work can realize in some measure the amount of vile sludge hidden from sight on the bottom of New York Bay. Can all this be improved? is the question of the day. I think it can. Let us try. As Dr. Manley has stated, in the very formation of refuse, at its source, there are two kinds, the illegitimate and the legitimate. The first, I think, he has settled; so we will look at the legitimate as it should be presented for collection.

Every household should have two sizes of receptacles. The garbage composing only about twenty per cent by weight of the entire product, the smaller should be reserved strictly for that alone. The galvanized cans are very good, but they should be provided with a well-fitting cover, either hinged on strongly or chained fast, to prevent its being mislaid. The garbage should be collected at night, as usual in other cities. It would be well to have certain definite nights for certain districts, so that the householder may be prepared. Have the garbage can placed within the stoop line, at some spot easy of access. Have the carters under positive orders to carry the cans out to the cart, and replace them covered within the stoop line after emptying them. Insist that the cans shall be cleaned by the owner before refilling, as soon after being emptied as possible. Any one opening the ash closet under the stoop will admit the necessity of this. With our carts there is much that is faulty. No doubt it would be better to have two sorts, one for ashes and the other for garbage. At present this is not absolutely necessary; and in all sanitary questions the great obstacle is expense—the public appropriation being usually meagre—hence we must modify our cart and use it night and day, only changing men and horses; by this means doing away with the necessity for storage room for the vehicles and providing stable room for the animals. When new carts are built, they should still be of boiler iron with the addition of a flanged cover of the same metal. The cover must be kept closed except so far as loading actually demands. In London the front yards are deep excavations extending from the house to the sidewalk, and just inside the gate is an iron stair reaching to the pavement of the yard some eight or

ten feet below. Under the stairway the covered cans may be constantly kept, sufficiently in shadow not to attract attention, and yet allowing all the filling and cleaning to be performed without the necessity of bringing into the house proper. The covers of the carts are divided in four or six in the four-wheelers, thus minimizing the exposure, by requiring the opening of only a small portion of the top when filling. These wagons are not readily distinguished from coal carriers in appearance, an advantage not to be overlooked from an æsthetic point, particularly in those neighborhoods where the imagination and hyper-sensitive noses carry their owners beyond the bounds of reason. This is happily illustrated by Dr. Hoyt, of St. Paul, who wittily propounds a new focus for hysterical germ disease. "Take," he says, "a brand-new empty cart, fresh from the shop, covered, and having the word 'garbage' conspicuously attached to it. Allow it to stand on a prosperous residence street. In a very few days a large part of the adjacent population will be under medical attendance or threatened with a pestilence, and the air will be full of petitions to the Health Department." This picture, he adds, is not overdrawn, for he has had an experience of just such an absurd performance. I can testify to a personal observation along the same lines.

If the cart is to be used for ashes in the daytime, one of the most important precautions in its night use is to prevent contact between swill and wagon. In St. Paul they seem to have solved this part of the question. There, on the carts are placed strong, water-tight, wooden barrels; through the centre of each runs a stout iron rod with a screw thread on its upper extremity. Only one barrel is opened at a time, and when full the top is put on over the rod and screwed down very tight by means of a nut and large wrench, or by a powerful butterfly nut. When the top is thus fastened, we have a mass of garbage compressed and sealed in a practically non-breakable hard-wood cask. This may be handled, shipped or stored for a reasonable time, and when emptied and washed, with cover replaced, may be kept quite odorless. During the day the barrels are removed in a few minutes, and, *presto!* the garbage becomes the ash cart. In operation the garbage man goes into the front yard at night. Without uncovering any of the

cans he finds there, he knows that it is only with the smaller size that he has anything to do. So he takes these to his cart, empties each one into the only open barrel, recovers, and returns it to the place where he found it. This he continues to do from house to house until his first barrel is full, when he puts on the hard-wood cover, screws it down, and thus hermetically seals that portion of garbage. Next, he opens another barrel, and so on, till the load is complete, with no drippings and the smallest possible offense in bottling up an evil thing. Where shall these barrels be taken, and what shall be done with the contents? Formerly swill was used to feed cattle and pigs, but, as some one has aptly remarked, "this has been stopped because the New York Health Board objected to people sending swill out of the city, filtering it incompletely through the laboratory of a cow, and then feeding it to the children." The farmers tell me that many pigs were killed by the broken glass in it; and as fertilizers are so plenty and good, it would not pay for the trouble of gathering.

The newspapers and public are raising the cry of "Burn the garbage!" and after considering all possible methods of disposal it does appear to be the most radical and thorough means. But just here comes forward the bugaboo of the sanitarian—the question of expense. We find the economical disposition of refuse quite as important as thoroughness, and we find ourselves face to face with the problem, Is it better to consume everything, or try to utilize some of the waste products of a great city? continually growing greater. Rapidity is a very vital factor in the handling of such great amounts of material; and it depends largely upon two things, distance and the size and completeness of the disposing machinery. In the present method the first is the most troublesome element. When we think of hauling by the slow horse and cart, through snow and mud, and the long towing out to sea of the scow, dropping its load all the way, sometimes delayed by ice, often by wind, and bumping about in the swift tides waiting for fine weather, does it not seem a cumbrous, unscientific, and eminently unreliable relic of bygone days? It is quite rapid work emptying these vessels, with their false bottoms; but as to thoroughness, we are disposing our refuse on our neighbors' beaches, out of our sight, but we may hear from it through the

courts. I have heard many of the surf lovers attempt to describe their feelings on taking a cool morning plunge into the bright, clear ocean, and coming in contact with swill and carrion! It has been suggested that we bury our garbage; but this is manifestly even clumsier, if possible, than the present mode. In fact, after looking at various methods from every point, we are practically forced into cremation, or something similar, which holds out hopes of relief.

The simple crematory is a true engine of destruction; it will melt and burn everything we wish perfectly, and eliminate any baleful germ; yet it must be remembered that ordinary cremation does produce odors from the combustion of the enclosed material, and for this reason has been considered unfit for use within city limits, especially where dependence for fuel must be placed on kerosene or coal; but in regions where natural gas is available this trouble is lessened or obviated, so that we might even construct one in New York and operate it with fuel gas. But expense forms the ever-present objection, as it must be self-evident that this machine must be run at a constant expenditure from which there is no possible source of income. Yet even this would take less money to operate than the large fleet of scows and tow-boats now employed. From my experience with other cities, I have learned that there are at least two methods which are quite as satisfactory and cheaper than simple cremation. Within the limits of Pittsburg are several so-called garbage furnaces—I think six in all—built by the Rider Garbage Furnace Company. This furnace burns anything—manure, wet tan bark—everything, in fact; destroying all kinds of garbage, animal or vegetable, without odor or smoke. After six years' experience with it in the city limits the reports from the users and the Board of Health are such that there is no possible reason why we should not erect as many as we need right on Manhattan Island. The economy comes from the utilization of the heat to generate steam, and selling or renting the power produced, and it, in some instances, is run at a small profit instead of being a tax upon the community. The residuum consequent has a commercial value to farmers and gardeners. In the practical use of this furnace fuel is used to get all its parts to the proper temperature, after which the garbage itself, if fur-

nished in sufficient quantity, provides most of the fuel necessary to maintain constant and continued action. The capacity of the furnace is from 30 to 60 tons a day, according to size. I have reports enough to fill a small book on the excellent work of this plan. One favorable fact is the small size of the furnace—30 feet long, 10 feet wide, and 9 feet high; capacity, 30 tons in 12 hours, 60 tons in 24 hours; costing, wages of two laborers to handle 30 tons, $4, or four men to handle 60 tons, $8. Coal, one ton, $3, or two tons for 24 hours, $6. Total, 30 tons, $7; 60 tons, $14. The gases are thoroughly consumed, and the garbage may be dumped directly from cart to fire.

Here is a report of Mr. Haswell's test:

Amount of city garbage consumed		80,000 lbs.
Excreta		25 300 "
Total		105,300 "
Residue of old iron and tin	135 lbs.	
Glass, earthenware, clinkers and cinders	1,624 "	
Fine ash	1,185 "	
Total		2,944 "
Loss		102,356 "
Residue of ash and cinder from preliminary heating of furnace		600 "

Residuum from garbage and excreta, $2\frac{88}{100}$ per cent.

And the following is an extract from a test in Allegheny City:

"Our Board of Health arriving at the furnace at three o'clock P.M., the charging of garbage began and continued until the whole of the following was charged into the furnace: four tons general city garbage, 450 pounds rotten tomatoes and sauerkraut, 30,500 cucumbers, onion peelings and spoiled onions, all in salt brine; total, 20 tons, 1450 pounds, all of which were entirely destroyed at five o'clock, at which time the test closed, occupying just two hours' time, without odor or smoke. It does seem reasonable to state that if this furnace or some similar method could be located within our city limits, and the garbage be delivered directly from the cart, and all reshipment and repeated handlings avoided, we would have the question solved. In Pittsburg the odor is destroyed by an 80-foot chimney and the thorough combustion in the furnace. But we could easily add to the height if necessary;

and those of us who have seen the chimneys at the Glasgow chemical factories know that the most powerful stenches may be entirely destroyed by a 500-foot chimney and forced draught. I think we can consider the odor objection disposed of."

The Engle Crematory in Des Moines destroys 145 yards of refuse and a dead horse in 24 hours, at a cost of ten cents per yard. This furnace melts and destroys various mixed garbage, tin cans, and small scrap iron quite readily. In Halifax, England, a steam-making furnace furnishes power enough to run the electric-light plant of the whole city (80,000). In London, at Chelsea, there is a refuse disposal company which utilizes about thirty-five loads of refuse a day. Here is practically no dumping ground, the material being thrown directly into a separator which sifts out ashes and dust, allowing the cinders to be deposited clear and clean, the ashes and dust being blown through the fire by means of a powerful exhaust and blower and reconsumed ; the cinders, lighter manure, and straw being used for fuel. The bits of paper are carefully collected and manufactured into cardboard on the premises. The residual ashes, china, and broken glass are all powdered and ground together and utilized for building sand in the northern parts of England, where sharp-edged sand is rare and expensive. According to the testimony of the natives, it answers quite as well as any sand for this purpose. Any part remaining which can be used as fertilizing material is so treated, and, in short, only the truly offensive and useless material is burned. In this establishment the apparatus is quite expensive and elaborate, and the primary outlay correspondingly large ; but the economy comes from the absolute lack of waste and the labor-saving machines. And such apparently valueless material as bits of glass, china, iron scraps, tin cans, and clean ashes is made to bring some return in money. Such figures as I have would be of little or no value to us, because everything is graded on such a different scale, where one can hire a large four-story 30-foot front house for $45 a month.

In the Southampton works 60 carloads a day is the average amount of sewage consumption ; sludge and street sweepings are converted into a patent manure, the consumable refuse

furnishing sufficient fuel to operate the entire plant, and the resulting ashes, with broken glass, china, etc., are used for railway fillings and compressed into blocks for paving purposes. In Paris the methods of disposal of sewage are very interesting, but outside of our subject. Cremation is used to some extent after every conceivable object which may prove useful has been picked out by the rag-pickers, who represent a regular trade there, regulated by law. But here in New York we have no room for a great garbage heap, and the rags and bones brought back into the city from such as we have have often proved foci for diphtheria and kindred troubles.

In regard to the nuisance of crematories in foreign cities, in London, at Chelsea, no odors were perceptible or complained of. The people of Southampton seemed quite proud of their buildings and methods. It has been everywhere impressed on my mind that the odor only arises from the accumulation of garbage and not from its destruction. Certainly there is nothing offensive about the Vienna process. This is a method of desiccation rather than cremation ; it is well adapted to American needs.

The works of the Merz process are in great favor in Buffalo, this State. Dr. Edward Clark, of that city, writing on the subject, says : " The works are just outside the city limits in the town of Cheektowaga. When we began to operate them the garbage was allowed to accumulate under sheds because of the limited capacity of the works, and because other substances had to be separated from the garbage before it could be dried. The people of the neighborhood complained bitterly, and the town Board of Health threatened to go into the courts unless the evil was remedied." He then adds that on a reformation of method, such as limiting the amount supplied to the capacity of the plant, drying the garbage immediately, and doing away with the sheds, all odors and complaints ceased at once and together, one of the most noticeable features in the whole process everywhere being the wretched stench in the delivery room and the entire absence of odor, with the exception of a faint smell of benzine, in all the other parts of the plant, not as strong as you often find it in the tailor shop when he is doing some cleaning. This is so marked and well-defined a change as to strike the visitor at

once ; and the smell of the delivery room may be quite abolished by cleanliness and washing out the carts with a powerful stream of water through a hose after dumping. In our plan it would be the barrels that needed washing. This desiccator has been found very economical by means of utilization of biproducts ; and it has been found that the larger the amount of garbage to be converted the greater the economy, the saving beginning with 100,000 cubic yards and increasing in a small but definite ratio. To-day, in this country, the system is working satisfactorily in Buffalo, St. Paul, Milwaukee, Chicago, and Paterson ; but in each and every case when erected within city limits the plant must have capacity enough to do away with any storage, for while the apparatus is odorless in its workings, the garbage is not. Of course the Vienna process is familiar to all of us here, and I will dismiss its description in very few words.

It consists, roughly speaking, of dryers, condensers, and extractors, and is more expensive at first cost than some of the furnaces. The dryers consist of metal cylinders, into each one of which about three tons of garbage may be dumped ; the cart or barrel is then cleaned and sent back at once for another load and another cart emptied. When full, the dryer is closed perfectly by a suitable cover and fastenings. The contents are subjected to the action of steam at 300° by means of a second surrounding cylinder acting as a steam jacket, the dryer and contents revolving around and being stirred by a metal cross-armed mixer, mixing and drying lasting six hours, the garbage losing 60 per cent in weight by the process, due to escape of watery vapor. This vapor, passing through condensers—fire and water—is finally allowed to escape into the sewer as a sterile, odorless liquid. The solid remaining in the dryer is then turned out into covered conveyers and carried to the extractors. Here it remains for another six hours, and is treated with benzine, to remove all fats and oils, after which the benzine is recovered by a peculiar method and is used again. By a slight modification of the machinery dead animals may be desiccated. Thus we see that most of the biproducts are extracted and may be utilized in the various arts to which they are applicable, constituting a source of revenue, so that all is not waste and outgo, as in the case of

the simple crematory. The vapor of the drying is loss; the fats are at present sold as an excellent axle-grease, but surely have a more extensive use. The residuum has often been exposed for long periods of time without odor, but the farmers buy it gladly. At the plant in Paterson, N. J., Dr. Manley and myself were struck with the fact that the Merz system was located in the city, and presented no nuisance whatever. Only just around the corner many of the natives could not tell us where it was. In fact, the only odor noticeable was that of the city gas works, some distance away. Here about sixty tons a day are disposed of—rather a small amount to show any great saving in operation. Only three workmen are necessary. The glass and tin cans are picked out and sold; the final residue is disposed of at $1 per load for fertilizing farms. Of course many details would be more scrupulously watched in New York. If the garbage of a city containing nearly one hundred thousand inhabitants, and a manufacturing town at that, can be easily disposed of by so few men, there can surely be no reason why our own city may not be relieved. The absence of odor is the factor I would draw your attention to in both the Rider and Merz systems. The Rider people write me: "Our system is simply this: Our furnace is so constructed that, after heating it to 1200° or 1500°, we charge in the garbage. The heat eliminates the hydrogen, which, combining with the oxygen, makes an intense heat, thus consuming the garbage thoroughly by its own fuel."

I take it the idea is that the gases are thoroughly burned before leaving the fire chamber. In the Merz process this is a more puzzling question; but Professor Chauvenet, of St. Louis, on investigating the subject, says: "I am of the opinion that little or no gas is given off in the driers, because I do not think the temperature (300°) high enough to decompose vegetable fibre." After seeing these systems at work I can see no possible reason why either or both could not be conducted with very ordinary care in any part of our city, provided that the public was not alarmed by "swill destroyer" sign on the building or sight of what was going on within, and in this manner frightened into that form of contagious illness engendered by the clean cart with the word

"garbage" hung upon it. Our situation on Manhattan Island makes transportation such an element in the final disposal of residue, that even if that residue have a value, the cost of boxing and shipping may more than offset it. It may be in both systems pressed into cakes and packed into boxes or barrels and sent any distance without any more trouble than brick in the Rider, or as easily as tallow or stearine in the Merz. The Rider gives us 2½ per cent, and the Merz about 20 per cent. The Merz products are the more valuable, but the Rider economy comes from its steam-furnishing ability. Thus we have the problem, Will you attempt to sell a large mass of fertilizer to farmers, who already have plenty of good and cheap fertilizer, made from fish, and who will expect the city to pay the freight, or will you try to dispose of a small amount, trusting to steam-power, which always has its price, to bring you a return on your investment? Farmers refuse to buy manure in New York. In Brooklyn it costs 50 cents per load, but the ferriage to and from New York costs from 40 cents up. Where is the profit? The garbage with both is reduced from a valueless mass dumped into the sea, with its fats and vegetables floating on the surface of the water, to something having a commercial value and non-putrescible.

So much for the garbage at present. Let us consider the ashes, and with them let us include the ordinary sweepings of sidewalks and streets in front of the houses. In the first place, the ashes must go to the cartmen, but what shall we do with the sweepings? We should allow them to be gathered by the Street Cleaning Department, to whom they legitimately belong. These sweepings are quite a nuisance; and perhaps, in passing, we can rid the household of something that is practically unknown in most large foreign cities. In New York, when the streets are swept, we have all seen the little mounds of dirt lying about until the wind scatters them, to be again swept up and redistributed. The process in the windy winter and spring months is rather detrimental to eyes and throat. This may all be avoided by a simple expedient. In London on every street-crossing corner you will see a cast-iron affair resembling a huge letter-box, the street orderly, into which the street sweepings are at once deposited when swept up, each gang of sweepers having a wheelbarrow. But

then over there all refuse has value; even dried manure is used as fuel in the garbage furnaces. Few who have not seen manure under powerful draught can appreciate how readily it makes heat enough to generate steam. The street sweepings wait in the orderly for the cart, and the wayfarer is unmolested by dust storms. Perhaps with us it would not pay to attempt to utilize street manure for fertilizing purposes, owing to its composite character—a mixture of horse droppings, glass, china, papers, and brown sand, the glass coming from various sources, haps and mishaps, the papers from the citizen and the moving vans, the sand mostly, if not entirely, drifting down the streets from the railway tracks on the avenues. The papers are unsightly, and may be uncleanly. The littering of public highways has been stopped by law abroad. In many cities, in Paris or Berlin, if you throw down any waste paper in the street a gendarme immediately asks you to pick it up. The street orderly provides a convenient place in which to deposit it. One of the most prolific sources of this unsightly material is the moving van, in which it is used for padding. If you glance down a street where one or two families are moving, you will see the van swept out where it stands and the pavement strewn with waste paper and excelsior. This should not be tolerated; but the paper should be kept in the van as far as the corner and then packed into the street orderly with sweepings and horse droppings. The sand, now illegally used, will grow less and less as the cable extends, and even now its greatest source is the tramway company, too parsimonious or too poor to properly shoe its horses. In London such wholesale excavations as are common here are never seen. A contractor may only tear up such a length of street as he can utilize and finish in one day. The pavement is relaid that evening. Naturally the water and gas pipes, being under the sidewalk, make this a very much easier problem than with us, because the roadway is always clear, and pedestrians can walk around a sidewalk obstruction or cross the street. Our constant upheaval of street soil and the badly relaid pavement are productive of much disease and unnecessary dirt.

We have now to consider the third head of our paper, the ashes. Let us begin with the ashes at the house. With ashes

may be mixed broken china and glass, nothing else. Let us have containers of galvanized iron of a regular and uniform size, with covers movable or hinged, as in the garbage cans. Let the size be such that can and contents shall not be over one hundred pounds in weight, easily carried from area or front yard to the gutter, have a black indelible line around inside, four inches from the top of the rim, above which the can shall not be filled. Two kinds of carts are best, but economy rules, and therefore the wagon is the one that went to the desiccator the night before with its contents in casks and with its flanged boiler-iron cover cut in four, so that only one fourth of the top is open for the reception of ashes. The driver takes the ashes to another part of the Merz plant, where is an ash sifter, as in the London works, where the cinders form a great portion of the necessary fuel used in converting the garbage. We now have the ashes, glass, and china separated into cinders and dust; this dust may be driven through the fire and aid in consuming the cinders. The Street Cleaning Department may also deliver the contents of the street orderly in this part of the plant, and the manure, waste paper, and sand put on the fire as well. Leaving from our ashes glass, china, waste paper, manure and sand, only a small residue of thoroughly burned ashes, some melted glass, bits of broken china, and sand. For many years we have need in our own city of all this remainder we can obtain, and there is a useless waste in sending it away—a waste not only of the cost of transportation—about 80 per cent of the expense—but a waste of valuable material. The ashes, china, glass, and sand may be used in filling bulkheads, in making roads, and after the building department makes a few experiments with bricks from ashes and sand, built with artificial sand, as used in England, I am quite sure it will be very willing to foster their use here. Ashes as at present mixed with garbage is unfit for filling or road-making—in fact, is practically useless; but when cleaned and sifted and the cinders reburned in the crematories, there is no filling comparable with it for solidity and sanitary dryness. The paving slabs and bricks made from it seem to fill all requirements for pavements, the foundation of macadamized roads, or in buildings. The ashes that at present represent a delirium of how not to do it, a confused

heterogeneous mass of 20 per cent kitchen refuse, 80 per cent junk, trash, swill, and ashes, plus bacterium, termo, and other germs, q. s.—these are what we are taking away, while we buy other materials for the uses which these would fully serve.

Should one ask me how to transport the garbage of Manhattan Island, I should surely be tempted to reply, "By not transporting it," by leaving it where it is until we manipulate it and make it worth buying, and the buyers will remove it quickly enough. If we have our city parcelled out in districts, with a garbage furnace in an accessible point in each, we can make use of contractors, and we can hold each man to his contract by penalties, and compel him to perfectly destroy and remove every vestige of garbage and residue. Many of our factories could, by introducing the Rider furnace, make steam enough to generate all their power, as do the tanneries in Pittsburg, and at the same time destroy 60 tons a day. As soon as this fact is brought home to our manufacturers they will gladly avail themselves of the opportunity of reducing their coal bills. The great Duquesne Tannery, in Allegheny, is now only paying $100 per year for coal, the furnace consuming all the wet tan bark, containing 60 per cent of water, and offal from currying hides, and furnishing steam for a 100-horse-power engine, making all the steam necessary continually and at any atmospheric temperature. They also add that the coal would cost nothing if the workmen were careful to bank the fires when quitting work. Perhaps it might be interesting, in closing, to say that in Pittsburg two-horse wagons are used in collecting; and I have an estimate of an approximation of dwellings to population there, not including hotels, boarding-houses, restaurants, and grocery stores. Population, about 240,000, 5 persons to a house; legitimate refuse per day per house, 10 pounds; number of houses, 48,000; garbage, 480,000 pounds—240 tons; four furnaces at full capacity destroy 60 tons each; one team and one man gather and deliver in a radius of one and one half miles from furnace 6 loads, 12 tons daily—20 teams, 240 tons. With the furnaces centrally located the expense is reduced to a minimum. The cost of the cremation is nominal, but the collecting is very expensive. As there is no smoke or odor, there is no nuisance. Let us make proviso for 2,120,000 people, thus leaving a mar-

gin for repairs and growth. This would require thirty-two 60-ton furnaces. Distance of carting short, but the work heavy on account of denser population; therefore have two men to a wagon. One hundred and sixty teams gathering 1920 tons a day, or 80 wagons with double teams of men and horses working night and day would be sufficient. One dollar in labor and fuel, using cinders and manure, is considered ample for 10 tons; this would give $192 per day for a city as large as New York and Brooklyn combined. And still from this must be deducted the earning power of the plants—say 100 horse power each (I understand it is about 250 horse power), but say 100 horse power for 32 furnaces—and a residue sold for fertilizer.

Those who are versed in engineering may calculate the earnings of 3200 horse power night and day, when converted into electricity or used in running machinery. I think you will readily find that the garbage can be perfectly disposed of at less than two thirds of the expense of our present makeshift. You would be disagreeably surprised at a comparison of the cost to the community in many cities compared with an equal population in New York. Then consider that our wasteful system does not dispose of it; and the "wonder grows" that cremation was not long ago adopted here. Live steam has been worth $100 per horse power a year; the cheapest rate is $50 to large users—an earning power for the furnaces of $160,000 annually against a great loss in the scows. Maximum cost of operating crematories, $70,080, leaving a net profit of $89,920. The expense of gathering is the item of loss, and that cannot be greater than it is now. An ingenious idea in collecting garbage has been proposed to me, and I will mention it in closing. You will no doubt recall the fact that last summer the State of Delaware was overrun with caterpillars, destroying the leaves of the fruit trees and paralyzing the Department of Agriculture by their multitude. So at last in despair it was resolved that the cocoons be paid for on delivery, with the result that an army of unemployed men, boys, and girls gathered so many that the pest, which found the department unable to cope with it, was utterly destroyed by the people.

Now, if you could offer a penny a pail for garbage, the same

for clean ashes delivered at the crematory, you would have all the idle men, women, and children delivering refuse at a very low rate, enabling us to use our carts and horses elsewhere, and to better advantage. Make the swill worth something, and there will be an easy "disposal of household garbage."

Since the above was written my attention has been called to two plans. One, originating in this city, contemplates the use of propellers to carry away refuse. On investigation it appears that each vessel will cost more than a crematory, about three times the daily expenditure to operate, double the yearly sum for repairs, and all this is actual waste, because it does not dispose of any garbage, only transports it. The second way is an idea similar to my own, of utilizing steam power, and is suggested by Mr. T. W. Baker, of the London Society of Engineers. By his plan he guarantees a saving to the local authorities of $12,000 per annum, besides interest, expenses, etc., and this in a city where the present system is much more economical than in New York. The London *Lancet* says: "It is by no means the first example of success attending the efforts of man to convert a waste into a wealth of material."

The Average Composition of Town Refuse, as given by Mr. Baker, in a paper read by him at a recent meeting of the Society of Engineers, is as follows: Breeze, cinder, and ashes, 63.69 per cent; fine dust, 19.51 per cent; vegetable, animal, and various mineral matters, 4.61 per cent; waste paper, 4.28 per cent; straw and fibrous matter, 3.22 per cent; bottles, 0.96 per cent; coal and coke, 0.84 per cent; tins, 0.79 per cent; crockery, 0.55 per cent; bones, 0.48 per cent; broken glass, 0.47 per cent; rags, 0.89 per cent; and iron, 0.21 per cent. Looking at this list, it will be seen that the constituents possessing fuel value practically cease with the 3.22 per cent of straw and fibrous material, and at least 90 per cent of the total refuse is combustible.

DIET FOR HEALTH.

By John Aulde, M.D.

The question will be asked at the outset, What is to be understood by the expression, diet for health? In answering this, we must bear in mind the wide latitude which is possible to be embraced in the inquiry. A person may live on a diet which barely sustains life and still maintain apparent health. Again, a man may be so constituted physically and mentally (eccentric?) that every portion of food must be weighed, and only those products selected which the physiological chemist says ought to be taken into the system. We may pass these two extremes, and for the present we may also omit a recapittulation of certain scientific data in regard to nitrogenous foods and carbohydrates, the main object of the present article being to embody some practical suggestions to that large percentage of humanity who aim to get along without the assistance of medicines. While the employment of medicines is not condemned, the fact should be emphasized that medicines, as a rule, are of secondary importance; when used, however, they ought to be administered with precision as to the effects which they are supposed to produce, and when so employed, not harm, but good will come.

As a skeleton outline of the principles to be observed in diet for health, the following points are offered for consideration:

I. Time for meals: As far as possible, meals should be taken at regular hours, and too long a period should not elapse between any two meals.

II. Time for eating: Much depends upon the proper mastication of the food, and as the salivary secretion is an important aid to stomach digestion, due allowance must be made.

III. Character of food: The character of food embraces a wide range, but for convenience in this study, it will be divided into (*a*) solid, semi-solid, and liquid, and (*b*) nitrogenous and carbohydrate.

IV. Fluids with meals: Since the digestive processes are hastened by hydration, fluids are necessary, but they must be used with discretion.

V. Alcoholic and malt liquors: On general principles the use of alcoholic or malt liquors as beverages must be condemned, although under certain restrictions no immediate harm arises from their occasional use when taken with meals.

VI. Late dinners: By this expression is meant six o'clock dinners, and is not intended to apply to midnight eating or banquets which extend over a period of several hours.

Taking up in their order the foregoing points, it will be an easy and natural method to develop the practical bearings.

1. That meals should be taken with regularity, no one, it seems, will be disposed to question, since it must be apparent to the most unsophisticated that nature favors certain habits, and one of these is the production of digestive ferments. A person in health accustomed to his regular meals will, when the proper time has passed, fail to experience his natural zest for food. Sometimes the appetite will be wanting altogether, while at other times he eats ravenously without regard to either the taste or the character of the food set before him. These peculiarities are often more noticeable in those who neglect to eat for long periods, and the writer entertains no doubt whatever that many persons thus lay the foundation for future illness by a disregard of this caution. When a man begins to explain that he feels better without a lunch in the middle of the day because he has such a good appetite for his six o'clock dinner, we may calculate with a considerable degree of certainty that he will shortly be in the hands of the physician—provided he should be so fortunate as not to die suddenly from some supposed occult cerebral trouble. So recent as the morning of this writing a report comes from a neighboring city that a man died in the ambulance on his way to the hospital, and that the coroner's jury found that death resulted from congestion of the brain, brought on by eating too much ham and beans.

2. Time for eating is a most important factor in securing and maintaining a healthy condition of the digestion. When food is properly masticated it is acted upon by the salivary secretion, which is not only an active solvent, but is also an

efficient digestant, acting energetically upon starchy food-stuffs. In fact, the latter, when properly manipulated—without liquids—are almost completely digested when they enter the stomach; and besides, the bolus is alkaline, and it thus becomes an important aid to stomach digestion, its alkalinity being a valuable stimulant to the digestive function proper. But as the mastication of the food requires time, there is a temptation to take liquids of various kinds, and although a small quantity may do no serious injury, the habit gains on a person, and after awhile he begins to feel that his digestive capacity is limited. Let all such act on the above hint, masticate the starchy food-stuffs thoroughly, take liquids only toward the close of the meal, and they will soon believe that they are feeling young while getting old.

The advantage of taking liquids toward the close of the meal are various, but the most important one is due to the fact that hydration is necessary to digestion. In the stomach only albuminoids are digested; fats and carbohydrates are digested in the small intestine. Actual peptic digestion does not begin in the stomach for some time after the ingestion of food, estimated at from fifteen minutes to three fourths of an hour, and under normal conditions. the contents of the stomach remaining at the end of two, two and a half, or three hours are gradually poured into the small intestine, there to come into contact with the bile and pancreatic juice. Thus, when a man eats in moderation, masticates his food properly, and takes a liberal supply of liquids toward the end of his meal, he will feel no discomfort from the food taken; but about midway between meals a sensation of thirst will occur, the thirst being brought about because of the hydration required for the intestinal digestion. This routine is simply the result of certain chemical and physiological processes that are taking place in the human economy, and when the supply of food is not regulated as to time, the derangement of function may be readily traced.

3. Upon the character of the food ingested depends the activity of digestion. Liquids and semi-solids, as a rule, being more easily manipulated than solids, are more quickly absorbed. The time required for the digestion of solid food-stuffs also depends upon various factors, particularly with ref-

erence to the method of cooking; but as this question is foreign to the purpose of this article, it will not be considered. Whatever the kind or character of food, it should be eaten slowly, and the starchy foods thoroughly masticated. Meats free from fibrinous shreds and properly cooked—may be eaten with but little mastication, as digestion here takes place in the stomach, and with a moderate supply of water, which is the best diluent, digestion proceeds uninterruptedly.

As to the advisability of nitrogenous or carbohydrate foods, there is much to be said on both sides; and since the organism requires both, it seems the part of wisdom to make a suitable division. Those who live principally upon bread, potatoes, and the like do not appear to possess the same tenacity and persistence which is characteristic of those who depend principally upon meats and other nitrogenous foods. Of one thing the writer is thoroughly satisfied—namely, that the most efficient diet for work, either mental or physical, consists of a fair proportion of both bread and meat. With this as the main dietary, a person will get tired, but with a little rest or sleep, he is just as well able to begin another day's work as in the morning after a good night's rest. On the other hand, many who subsist largely upon potatoes and other carbohydrates, appear to be constitutionally tired, and it is probably for this reason that the sale of proprietary medicines in this country has attained such enormous proportions. Most of them contain some purgative principle, which, once begun, must be continued; and these potato-eaters and water-drinkers are constantly complaining of constipation. Intestinal indigestion is, therefore, far more common in this country than derangement of the stomach.

4. While fluids should always form a portion of each meal, the introduction and liberal use of ice-water has developed in America a vast multitude of ice-water dyspeptics, and yet it would be difficult to convince one of these that this plan of eating and drinking is harmful to him, although it might be so to others. In dealing with such, therefore, I have found it advisable to interdict the use of fluids, except a very little from time to time during the meal, without assigning any special reason. People who eat bread and potatoes and drink water with meals get stout, but they lack staying powers, and

can neither run nor walk at a rapid rate for any considerable distance. When water, tea, or coffee is used to help swallow the food, it enters the stomach in a condition favorable to start fermentation, and it is a fact that those who follow this practice frequently suffer from dilatation of the stomach, and with this there is associated paralysis of the circular fibres of the muscular coat of the intestine. This again leads to distention of the abdomen with more or less involvement of the liver, and as a sequel we have complaints of alternate diarrhœa and constipation.

5. Like tea and coffee, alcoholic and malt liquors delay rather than hasten the processes of digestion, and especially is this true when the quantity is sufficient to arrest the peptic ferment; in this case the ferment is permanently destroyed, and the work of secreting it anew must be repeated, all of which takes time and permits chemical and physiological changes to take place. In the case of those given to the regular ingestion of wines, beer, or whiskey with meals, we have the almost universal complaint of rheumatic affections, although this is nothing more than an indication or effect of auto-intoxication. A few doses of the salicylates will be sufficient to clear this up for the time being; or a dose of purgative medicine will answer the same purpose; but neither removes the cause, and as a consequence this form of medication must be repeated again and again. Moreover, alcohol deranges the liver; and thus we see how intimately related are alcoholism and disorders of digestion.

6. Late dinners, or six o'clock dinners, are condemned by some and approved by others; but to those familiar with the physiological needs of the body there can be no question. Whoever suggested that it would be policy to keep the baby at the breast awake after nursing in order that digestion might be completed? Indeed, rest is the most appropriate thing after meals, while work, either mental or physical, cannot be successfully performed when digestion is active. It is far better, therefore, for those who pretend to work, that a light lunch be taken about the middle of the day, with the principal meal at the close. The evening then can be spent in suitable recreation or light reading, so that a person retires in the most favorable condition to secure repose, and his slumbers

will not likely be disturbed by harrowing dreams or recurring nightmares. Intestinal indigestion is the principal cause of insomnia, but this may be avoided by a proper selection of food-stuffs for the day, and more especially the evening meal, when the proper digestive work will favor rather than interfere with normal sleep.

In the foregoing remarks I have touched but slightly upon the scientific aspects of digestion, but they are in line with the suggestions usually made to patients suffering from inappropriate diet, and from extended observation and experience I am fully satisfied of their practical value. Moreover, I feel confident that were these suggestions placed in the hands of the more intelligent people, we should have less demand for remedies for indigestion and constipation, with their concomitants, insanity and melancholia. The present trend on the part of the laity is toward medicine, while I firmly believe the greatest improvement would ensue if the advance were in the other direction—away from medicine. The present generation has become all too familiar with medicine, and should be educated for the benefit of health more in the direction of avoiding it as far as possible, certainly against the practice which now obtains so generally, that of self-medication.—*The American Therapeutist, October*, 1894.

THE MICROBES OF BREAD.—Fresh bread, uncut, is free from microbes, the heat of the baking being sufficient to kill them. But immediately the bread has been cut and exposed to the air it offers to germs of every kind, and especially pathopine ones, an excellent culture medium.

White bread offers a better soil than black bread or rye bread, in consequence of its lesser amount of acidity.

It is a singular fact that if the bread is sterilized by an exposure of fifteen minutes to a temperature of 115° C. the vitality of germs is increased, which is evidenced by the fact that the heat causes a diminished amount of acidity in the bread, which thus becomes a more favorable soil or medium. —*La Revue Med.*

AMERICAN PUBLIC HEALTH ASSOCIATION.

Abstract of the Proceedings and Papers of the Twenty-second Annual Meeting, held at Montreal, Canada, September 25th–28th, 1894.—Continued from page 36.

THE THIRD DAY'S PROCEEDINGS, Morning Session, after the usual announcements by the Business Committee, opened with an elaborate committee report on CAR VENTILATION, by Dr. GRANVILLE P. CONN, chairman, of Concord, N. H., of which the following is an abstract:

"A report upon this subject must include several topics; for in order to bring before the public a full realization of its importance, we must consider the construction, the heating, lighting, and ventilation of coaches, as well as the methods of car cleaning now in use by the managements of most roads.

"This last is most essential, as it is the first principle of sanitation, without which nothing like a healthful standard can be assumed.

"The problem of car sanitation is one of complex character, and involves so many mechanical questions, that one can hardly be expected to bring out the whole of the subject in a single paper.

"In the design of a car it is important that it be constructed with a view to stability, safety, and endurance. It is virtually and for the time being a house on wheels, into which the varying number of people are expected to make their homes for a longer or shorter period, according to the distance which they may be expected to travel. Therefore, like a house, it should be constructed upon sanitary principles, in which ventilation, heating, and such conditions as will allow it to be kept clean, are paramount factors in every case. Unless these sanitary principles can be carried out, and made permanent, then this house on wheels becomes unwholesome, and the conditions become favorable to disease, or of disseminating it should a contagious malady find a place within its

walls. Theoretically speaking, a room or a car into which a large number of people are to assemble should have left out of its construction everything that is liable to foster or develop disease germs. Therefore, the plainer it can be made —the less upholstery, carpets, and curtains that are placed within—would seem to be the better calculated for health. Practically, however, the public demands something more than plain walls and plain seats, and forget the conditions necessary for sanitation in their desire for luxury. This is an unfortunate circumstance, but it is necessary to deal with the problem as it exists.

"Referring to ventilation, twenty years ago the State Board of Health of Massachusetts instituted an investigation into the condition of passenger coaches. It was found that the atmosphere of the ordinary coach contained from one to six times as much carbonic acid gas as other public assembly rooms, such as churches, theatres, and public halls. The same year, 1874, at the meeting of the Master Mechanics' Association, the Master Mechanic of the Boston and Albany and also of the Old Colony Railroad made a report on that subject. It was taken up by the Association, and considerable discussion followed. Some improvements came from this action, but since that period the progress of ventilation in cars has not been rapid; in fact, it can scarcely be said that any improvements have been made. Recently, State legislation has placed the obligation upon the management to use steam heat, therefore the necessity of further improvements in ventilation has become apparent to every one. In ordinary weather during the winter the problem of how to heat the car with steam, and not have it too warm, is far more difficult of solution than how to prevent it from becoming too cold. These difficulties are largely due to the fact that the men who have charge of this work are incompetent to carry out the designs of the inventor of steam heat.

"Another fact in car sanitation, and the principal one, because it involves every principle of sanitation, is *absolute cleanliness.* This may be impossible in coaches, yet a near approach to it need not be considered impracticable.

"The problem of keeping a car clean is augmented by the fact that very many good people allow themselves and their

children, when riding upon the trains, to become slovenly, throwing things upon the floor of the car that never would be permitted in an ordinary dwelling-house. Why is it that people are so forgetful of good sense and good manners when riding upon trains is past comprehension ; yet we see it every day, and the coaches become excessively filthy from that cause alone. It may not be easy to break up such habits, yet if the trainmen formed habits of cleanliness in regard to the coaches which are under their care, it would have a very beneficial effect on the passengers. In the Pullman and Wagner coaches, where porters are employed to wait upon passengers and keep the car clean, when the occupants so far forget themselves as to cover the floor or carpet with the refuse of orange, banana, or apples, nutshells, and other things which render a car unclean, and the porter goes around with his dust-pan and brush cleaning it up, it does not take a great many miles of travel for such people to see the errors of their ways and to discontinue them. The same might be true of the ordinary coaches if the brakeman or person in charge should perform the same acts, for people naturally would become ashamed of throwing things upon the floor for another person to clean up in order to render the apartment comfortable.

" The question of how to ventilate a car is one which the mechanic and sanitarian must bring out together. It seems as though it would be quite impossible to invent any system that will change the air of a car while in motion, and at the same time be effective while it is standing still. With electrical power it may be possible to place fans in a car, the same as you do in a house, that will be effective when the car is standing still, but when the car is moving the pressure of the atmosphere upon the outside is so great that considerable change will take place inside the car. Then, again, this pressure of the atmosphere is so different when the car is moving slowly from what it is if the car is moving rapidly, that it brings up another point in the problem of ventilation to be solved by the practical mechanic.

" *The Railroad Car Journal* publishes the report of the committee of the Master Car-Builders' Association, from which I quote at length :

"'In all modern systems of ventilation, sanitary engineers endeavor to have a plenum instead of a vacuum, or, in other words, to have a slight excess pressure inside of the building instead of a slight vacuum. With a plenum there can never be any cold draughts or admission of dust, smoke, or cinders, for the reason that the pressure would always be driving the air outward through every crack and opening. With a vacuum the reverse is the case, and dust, smoke, and cold air will find their way in at every crack. It is very desirable that the windows of passenger cars be so arranged that they can be locked fast in winter time, to prevent one obstinate passenger interfering with the comfort of the whole carload, but this can only be done when a sufficient supply of fresh air is constantly being furnished to the passenger, comfortably warmed. The opening of the doors at stations is also a great interference with a uniform system of ventilation. This cannot be avoided, but the evil effects of it can be largely overcome by building the cars with an inner swinging door. Most of the modern larger passenger cars having smoking-rooms, double saloons, and heating apartments, can be easily fitted up with a swinging door at the end of the passage in between these compartments, which will act as a kind of air-lock and prevent a good deal of discomfort otherwise unavoidable. A convenient way of arranging the windows so as to avoid the draughts and interference to the comfort of the passengers in the winter time, would be to have the outer sash arranged, as is commonly the case now, with the inner sash adjusted so that when lowered they will lock themselves tight, and can only be released by a lever at the end of the car, attached to a locking-bar running the full length of the car on either side. These windows could be kept raised in summer time, the outer sashes being so that the passengers can raise them or lower them as they please. In the winter time, when these sashes are lowered, no windows could be raised.

"'To summarize, the ideal conditions would be as follows:

"'1. The admission of thirty cubic feet per minute per passenger of fresh air, and the carrying off of an equal amount of foul air, summer or winter.

"'2. The fresh air so admitted must not be moving at a speed of more than three or four miles per hour in winter time.

"'3. Fresh air admitted must be of a temperature in winter time of about 70° F.

"'4. Fresh air so admitted in winter time must have added to it a proper degree of moisture for the temperature at which it is admitted, according to the average humidity of the atmosphere, when at 70° in the climate in which the cars are running.

"'5. No system of winter ventilation can be more successful unless means for the fresh air supply are provided independently of and separately from the windows and doors, as well as the ventilators for carrying off the foul air.

"'6. The fresh warm air should be distributed through as many openings and as low down as it can be conveniently arranged for, and the foul air should be carried off through as many small openings in the roof of the car as can conveniently be arranged for in winter.

"'7. The ventilation should be entirely independent of the speed of the train, and act as well whether the car is standing or running.

"'8. The ventilation should be so arranged that there will be a plenum or slight excess of pressure inside the car, so that all draughts will be outward instead of inward, and smoke and dust thus excluded.

"'9. It is most desirable that double windows should be used, and so arranged that they can be locked fast in winter time, but readily opened in summer time.

"'10. It is most desirable that an inside swinging door be used, so as to form an air-lock or inside vestibule, to prevent the admission of cold air and dust every time the doors to the platforms are opened.'

"In arriving at these conclusions this committee had an investigation made under the supervision of an expert, and incorporated into their report something of his work, and the reasons for summarizing such ideal conditions as they have deemed necessary for perfect ventilation.

"The committee add the following:

"'It may be argued that there is no use for any such system of ventilation as this, that the present arrangements for the ventilation of passenger cars are good enough, and that nobody is any the worse for the present state of affairs. To

show that this is an entirely wrong position to take, your committee had a number of tests made to show the degree of foulness of the air in sleeping-cars, chair-cars, and day coaches, which tests have been under the supervision of Mr. William Forsyth, of the Chicago, Burlington & Quincy, through the kindness of Mr. Rhodes. Pure air contains from three to four parts in ten thousand of carbonic acid, and at 70° F. an average condition of moisture would be from four or five grains of water per cubic foot.

"'Micro-organisms, or disease germs, are not given off to any harmful extent in the exhalations of healthy human beings, but they are given off in large numbers in the breath and spittle and evaporation from the skin of unhealthy persons. Especially is this the case with people suffering from tuberculosis, whooping-cough, fevers, and so on, and the disease germs grow and multiply very rapidly in a foul, moist atmosphere.

"'Experiments made in Europe on animals which were inoculated with a preparation from the dust beaten out of the cushions of railroad cars in ordinary service, and which cars were not known to have carried sick people, showed that the most of these animals which were inoculated died of violent diseases. Few of them lived long enough to die of tuberculosis—none of them survived. As these micro-organisms are in the air and simply settle on the dust, all this goes to show how very necessary indeed it is to carry off the foul air, and that, to quote a Southern physician, the movement of vast masses of people annually from one section of this broad country in search of those climatic influences modifying the course and progress of disease has become, from a sanitarian standpoint, a great unsolved problem—namely, that of accomplishing the proper ventilation of cars by the introduction of pure air, free from dust, cinders, smoke, and so on, and at the same time the withdrawal of the impure air arising from the natural emanations of the body, as well as the more serious dangers accruing from chronic or contagious influences.

"'All devices which depend upon the speed of the train for their action, and where the air intakes surround the stove-pipe, every time the car stops the ventilating process ceases and may be reversed; at slow speed it will be almost inoperative.

" ' Great improvement could, however, be made in the condition of the air in our crowded passenger cars if the trainmen were compelled to pay proper attention to the ventilators. A regular set of instructions should be furnished them for their guidance, and division officers should be instructed to pass through the train at every opportunity and report cases where the ventilators have been neglected and the air overheated or foul to the division superintendent for discipline. The men would then soon learn to attend to this part of their duty. Sleeping-car companies should have a code of rules printed and posted in the cars, and their porters and conductors should be made to observe such rules. One specially important thing is not to open the ventilators on the windward side of the train, otherwise with drop sash or trailing sash ventilators down draughts and cross draughts are unavoidable.'

" In support of that part of the report which I have quoted —relating to the experiment on animals inoculated with a preparation of dust from passenger coaches—I will give an extract from the report of scientists who have recently concluded a series of experiments, under the direction of the Imperial Board of Health of Germany, as to the danger arising from the dust in railroad carriages. Their results show a decided risk involved in travelling under the present sanitary conditions of coaches :

" ' The dust was collected in each instance from a square metre of surface, and from forty-five compartments, representing twenty-one carriages. The inoculations were made upon guinea-pigs. Many of them died of various diseases, and the rest were killed. Three only were found to have tuberculosis. The number of bacteria was largest in the fourth-class cars, and grew less with each rise in grade of the compartments. In the fourth-class cars the number was estimated at 12,624 per metre ; in the third-class, 5481 ; in the second, 4247 ; and in the first-class, 2583. On the seats and upper walls the numbers varied in the four classes from 2646 to 29, while the roof was almost free. Though the third and fourth-class carriages were the most infected, it was much easier to clean them, as they could be washed with hot water and soap, which could not be so vigorously applied to the better class

carriages, owing to the carpetings and upholstery.'—*Boston Medical and Surgical Journal.*

"The following letter, written on a trip to the Eastern States, says: 'In our sleeper were three consumptives returning home to die, and that alone was depressing enough; but when, on getting up in the morning, one sees a considerable amount of dry, yellow sputum on one's *vis-à-vis* neighbor's bed linen, it is neither dainty nor reassuring. Morning cogitations, usually so pleasant, are apt to turn to the uncomfortable possibility of all the bedding in the car being subjected from time to time to the same infection, and being probably imperfectly washed or simply rinsed. Then it is impossible to clean the upholstering and carpeting without taking them out of the car, and an infected sleeper should be dangerous, as the continual vibration keeps the dust and bacteria in the air. The space is also necessarily confined. Moreover, travellers are apt to catch cold from draughts and from sleeping close to the windows, thereby rendering the mucous membranes receptive to germ implantation. They order these things better in Europe; on some of the continental lines special coaches are provided for consumptives, and these are constructed with particular reference to ready cleansing and disinfection at the end of every trip—which, it should be noted, are much shorter than the "runs" in this country, and the need of precautions is, therefore, and for so much, greater here than abroad.'—*Dr. Douglas W. Montgomery's letter to the Pacific Medical Journal.*

"All passenger cars at the present time are constructed with water-closets. The floor of such closets and a few inches of the side or mop-board should be covered with sheet copper, as an ordinary wooden floor will soon become filthy, and can never be made clean. Odors will always be given off from an ordinary board floor whenever the temperature rises to that of summer heat; but if the floor be covered with sheet copper, hot water, dry steam, and chemicals may be used, leaving it without any absorbing surface to develop odors which may be latent in cold weather and very active on a hot summer day.

"DR. S. S. HERRICK, of San Francisco, Cal., in commenting upon a statute law of that State relating to nuisance, remarks:

" ' Obviously, travellers themselves should not be held responsible for committing a nuisance, so long as transportation companies provide no facilities for obviating the same ; and the legislation should be aimed directly at these companies, holding them responsible and requiring them to provide an adequate remedy.

" ' Aside from considerations of health, it seems strange that respect for common decency has not abolished a practice in travel by land which would have brought a blush to common carriers in the good old days of slow coaches. While inventors and builders of palace cars are doing so much for the comfort and convenience of passengers in other respects, they adhere to a form of closet from which travellers must be excluded at the time when it would be most acceptable (halting at large stations), and which scatters filth and disease along the route. It is to be noted that cholera still lingers in Europe, and meanwhile we must not consider ourselves safe here within two weeks' travel by steam ; while the other filth diseases, like the poor, are always with us.

" ' In my judgment the time has come for sanitarians to speak plainly and forcibly on the subject, and to demand of legislators a specific remedy which courts will be bound to apply to this class of offences against health.'

" I understand several roads are making use of compressed air for the purpose of cleaning the draperies and plush covering of the seats, and that a plant for that purpose can be arranged to be effective with small expense. If this is true, and I see no reason why it is not, it should generally be used, for thorough cleansing with fresh air would be a most valuable disinfectant.

" LIGHTING.—Gas and kerosene lighting, while moderately expensive, are not only dangerous by reason of their possibility of fire, but the extra heat which they occasion in the car in the summer time proves a very serious obstacle to the comfort of the passengers. Then, again, the destruction of oxygen by gas or kerosene lighting increases the amount of carbon dioxide in the atmosphere of the car, oftentimes to a dangerous extent, and in that way the health of the passengers is seriously threatened unless there is a large amount of fresh air introduced continuously.

"That electric lighting is the ideal of the present time perhaps no one will dispute, unless the expense of the same is taken into account. So far as I can learn none of the devices for electric lighting have yet been brought down to the maximum of the manager's idea of expense, and, therefore, some other method will find favor until the public demand safety in lighting as well as in heating coaches.

"It would not seem that it would be necessary in a report like this to make any allusion to the water supply of railway coaches, but the Medical Society of New York have adopted a report calling attention to the danger of drinking-water from the average water-tank, as found in railway cars and other public places. Many cases of typhoid-fever of mysterious origin, it is said, could be traced to the filthy water-tank, which has been filled with water and ice of doubtful purity, and refilled from day to day without cleansing. Nevertheless, people must have something to drink in hot weather.

"From this we may learn that the public are critical regarding the water supply. Some years since Dr. Reed, of Ohio, in investigating this matter, found that the water-tanks of ordinary coaches, and sometimes those of palace cars, were notoriously filthy.

"In conclusion, I have but little to add, as until the use of such devices for lighting, heating, and ventilating we now have are fully understood and appreciated by the average trainman, who should be held responsible to his superior for the safe condition of his coach from a hygienic and a mechanical point of view, it is useless to assume that a more elaborate mechanism will find favor.

"Nothing as yet approaching an automatic system in heating, lighting, or ventilating of a car has been placed before the public, but as it is only a comparatively short period since automatic brakes and couplers have been placed upon the market, we may confidently look forward to the time when the public demand for hygienic improvements will evolve from the mind of man some plan or system to meet the emergencies of the occasion."

In the discussion that followed, DR. GIHON, of the Navy, said the problem of car ventilation had been solved several years ago. He held that the railways were criminally negli-

gent in failing to provide their cars with an efficient ventilator, for a suitable one had been tested by this Association at Charleston, S. C., a few years ago when it met there. The trouble was the expense; the railways must be made to overlook that in the cause of public health. The present unsanitary condition of railway cars is simply scandalous. When coming to Montreal he had been in a Wagner car, the air of which was so atrociously foul that he awoke in the morning with an unbearable headache. He would like some attention paid to the cars, which, with their filthy floors, are simply hotbeds of disease, especially when the means of propagating consumption and other communicable diseases are considered. In France, spitting on the floors is prohibited. On this Continent, syphilitics and others are allowed to spit on the floors of street cars at their own will.

DR. H. B. HORLBECK, Health Officer at Charleston, S. C., indorsed very forcibly the remarks of the gentleman who had preceded him. DRS. MONTIZAMBERT and LEE, also MR. E. C. JORDAN, of Portland, Me., coincided in the main with the views set forth in the chairman's report.

DR. CONN, in closing, said he thought there should be a federal head, such as a Department or Bureau of Health, having authority over these matters. He thinks if a copper-covered floor is provided in passenger cars and closets, it would be the most modern and ideal method in which they could be kept clean.

DR. FELIX FORMENTO, of New Orleans, La., chairman, submitted "THE REPORT OF THE INTERNATIONAL COMMITTEE ON THE PREVENTION OF THE SPREAD OF YELLOW-FEVER," of which the subjoined is an abstract:

"The Committee expressed its regrets that neither Cuba nor Brazil are represented at the meeting, also the absence of sanitary engineers on committee. The principal engineers and sanitarians of Cuba, Brazil, and Mexico have been invited to give their views on prophylactic measures in their respective countries.

"The report considered briefly the natural history of yellow-fever, first positively recognized toward the end of the fifteenth century in San Domingo and Porto Rico, thence invading Mexico and Central American countries. In the

seventeenth century it extended along the coast of the Atlantic as far north as Providence and Boston.

" In the South yellow-fever has existed almost every year up to 1878. The report gives the number of epidemics throughout the cities in the United States during the past half century. Permanent fever in Vera Cruz, Havana, and Brazil; introduced in Brazil as late as 1849, it has become a secondary fever.

" Interesting accounts of different visitations in American cities from 1693 to 1878. In the sea-coast country the disease affects all ages and dates, but blacks and young children are less subject to the disease. The report speaks of the so-called immunity of the Creole or natives which really does not exist; they have become immune by a previous, generally mild attack. Children died in large numbers during epidemics (formerly), but their deaths were attributed to malarial, croup, and pernicious fevers, etc.

" Local favorable conditions for the development of the disease; it does not belong to the South, is not indigenous to any part of the United States. Changing conflicting opinions in regard to quarantine, even in the South, as a preventive measure. No doubt exists any longer as to the possibility of protecting the whole country, of preventing the introduction of yellow-fever among us by an efficient system of quarantine, such as exists in Louisiana; fourteen years' experience proves this; since 1879 not a case in New Orleans. Nature of the disease a specific microbe, not yet satisfactorily demonstrated, requiring special conditions of temperature, bad sanitary conditions, etc., for its development. Numerous interesting examples given of its mode of transmission through infected articles, etc., explains the so-called immunity of Creole adults and children.

" Even in real yellow-fever countries (where the disease is indigenous) this immunity does not exist, as is proven by numerous instances given by Dr. Ruiz, of Vera Cruz. The disease has gradually disappeared in the North by improved local sanitation, also in Norfolk, Charleston, Savannah, and Memphis. The same results will follow in indigenous yellow-fever countries. Extensive engineering works, which will change the local sanitary conditions of these countries, may

require the assistance of their government. Governmental interference is necessary.

"In the mean time, every possible sanitary improvement should be adopted. Cremation recommended; proper disinfection of excretion; paving, drainage, sewerage work, removal of all organic refuse and isolation of the sick, etc. Additional reports should be made to secure the co-operation of the governments of Cuba, Mexico, Brazil, and Central American republics. The report is highly interesting in the vital question of stamping out yellow-fever from this Continent.

"The report was briefly discussed by DR. HORLBECK and DR. S. R. OLLIPHANT, of New Orleans, President of the Louisiana State Board of Health, who offered the following resolution, which was referred to the Executive Committee:

"'*Be it resolved*, That it is the sense of this Association that federal surveillance, control, or interference with State quarantine service as maintained is unwarranted and meddlesome. That the test of the efficiency of a quarantine service should be its past record, and the confidence and approval of neighboring States and other quarantine officers. That the solution of the quarantine problem should be left to the local health authorities to be worked out in accordance with their individual requirements, and all progressive steps encouraged so long as such advances are made within the limits of safety. That the formulation of regulations by the United States Marine-Hospital Service for control of State quarantine stations without conference with the local quarantine officials is to be deprecated, and can result only in conflict between State and National authorities. That the United States Marine-Hospital Service has rendered valuable assistance in the way of collecting and disseminating information bearing on quarantinable disease, and that it can become otherwise useful by rendering assistance when called upon.'"

FINAL DISPOSAL OF GARBAGE AND REFUSE, by DR. N. E. WORDIN, of Bridgeport, Conn., was the next paper, in which he advocated its destruction by incineration. He also recommended the use of domestic incinerators for the destruction of household garbage. In connection with this matter, the following resolution was offered by DR. M. S. INGLIS, of Winnipeg:

"*Resolved*, That a committee of this Association be appointed by the Executive Committee for the purpose of promoting the collection and distribution of sanitary literature and health by-laws on, and regulations to, the members of this Association, to be known as the Committee on Distribution of Health Regulations and Reports. Said Committee to have power to make such financial arrangements with members as will cover the cost of such distribution."

This was followed by the reading of the report of the Committee on the Disposal of Garbage and Refuse, by MR. RUDOLPH HERING, C.E., New York, chairman. He referred to the manner of the destruction of refuse in Europe, having just returned from there, where he found that incineration is about the only system employed to get rid of garbage. There are great differences in the refuse of Europe and of America, and for that reason systems which are efficient in one place may not be in the other. He had no faith in the schemes for the disinfection of garbage. The plan of separating or reducing the garbage also offers dangers, and, all things considered, incineration seems to be the best of all systems.

The next paper was on THE COLLECTION AND DISPOSAL OF THE REFUSE AND GARBAGE OF LARGE CITIES AND THROUGHOUT THE COUNTRY, by COLONEL W. F. MORSE, of New York, in which he remarked that New York had to deal with 6000 loads of garbage a day, or, 1,800,000 a year. The three systems at present in vogue there are: Disposal by reduction, by cremation, and by dumping at sea; the latter method includes the use of electricity to disinfect the refuse, etc., by throwing off iodin and chlorin of the salt water; within the next six or eight months New York will be able to announce which method is the most satisfactory.

DISCUSSION.

DR. S. H. DURGIN, of Boston, stated that he was trying to introduce in his city an appliance by which all householders could dry and burn their own refuse. His device was a small cylinder to place in the kitchen furnace flue. The speaker had one in his own house. The kitchen refuse is put in this receptacle and it is placed in position, and kept there for twenty-four hours. By that time the refuse is merely a mass

of carbon, which burns in the fire with a pure white flame. The next day's refuse is then enclosed in the receptacle, and so on from day to day. The appliance costs about $4. He called the apparatus a drying "family garbage crematory," and exhibited photographs of same.

DR. E. S. KELLY, of Minneapolis, said that no garbage in his city is emptied into the Mississippi River; it is removed daily from the city to a distance of eighteen miles on railroad cars. So, too, are dead animals removed in a similar way and are taken in separate cars. His city expends $40,000 a year to carry its refuse to this sandy tract. He mentioned, as an interesting fact, that an analysis of the water of the Mississippi below New Orleans showed it to be almost identical in composition with that of the river close to its source

DR. T. H. MCKENZIE, of Connecticut, offered a brief paper bearing upon this subject, which was in the nature of a written discussion containing in the main analogous suggestions, and indorsing those already known.

Next followed a paper on THE INFLUENCE OF THE CLIMATE OF CANADA ON HEALTH, by DR. W. H. HINGSTON, of Montreal. The writer touched briefly on the geographical situation and the topography of the country, and then went on to show that, after a residence in the country of shorter or longer duration, a change in the constitution of a person could be observed. The high color which flushed the cheeks of some Europeans faded somewhat, and the skin became less soft, the hair became darker and more like the aboriginal type, and the muscles were less prominent. The hot weather did not last long enough to produce any great disturbance of the liver, and the cold was exhilarating. The ratio of mortality in Canada was lower than that of Great Britain, and, with the exception of Malta, this country was the healthiest station of the British Army. Statistics gathered from the States showed that all constitutions were healthier as they approached the great northern lakes. Canada has no native malady. Most countries could boast of having some malady of their own; Canada had no such boast. If the health of a climate could be gathered from the natural increase of its population, Canada was one of the healthiest of countries, for the increase of its population was something enormous,

especially one section of it, the offspring of 60,000 of which had, in a century and a quarter, grown to millions. There was a large death-rate among children, the mortality being chiefly due to the fact that they were fed upon too strong food at too early a period. In conclusion, he said that the mortality in Canada was less in winter than in summer, which was different from most countries, and that consumption is arrested during the colder months of the year in Montreal.

The two succeeding papers were read by title—namely, "MECHANICAL VENTILATION," by MR. RICHARD FLEMING, Engineer to the Montreal Sanitary Association; and "BREVES CONSIDERACIONES SOBER LA FIEBRE AMARILLA EN VERA CRUZ (MEXICO) Y SU PROFYLAXIS," por el DR. GREGORIO MENDIZABAL, Orizaba, Mexico. ("Brief Considerations on Yellow-fever in Vera Cruz, Mexico, and its Prophylaxis.")

(*To be continued.*)

A BRAVE PHYSICIAN.—Benjamin Rush was eminent as a practitioner, both in private life and in the hospital staff, fearlessly combating the pestilential diseases that were common in his day, by one of which, edemic typhus, he lost his life in the sixty-eighth year of his age, on April 19th, 1813, as heroically as any soldier who ever faced a battle in the front file of a forlorn hope. What greater courage can man show than the incident related to Commodore Meade by his grandfather, whose father, George Meade, was Rush's intimate friend, by which it appears that in order to prove that yellow-fever, then raging (this was in 1793), was not contagious in the sense of small-pox, Dr. Rush deliberately swallowed a spoonful of black vomit ejected by a dying patient? True bravery, not mere bravado, since he sought to stay the panic fear, which was slaying its tens when the disease was only killing one. If courage be the attribute of the soldier who, in the heat of battle, with martial music and wild hurrahs, charges an enemy's battery, what shall that be called which nerves the physician, in the solemn stillness of a pestilence, to enter a crowded yellow-fever or small-pox ward, or encounter the deadly deluge of the ejecta of the cholera patient to whom he is ministering? —*Albert L. Gihon, Medical Director, U. S. Navy.*

ANTISEPTIC CLOTHING.

IN an article on "Les Tissus Antiseptiques" (*Journal d'Hygiène*, No. 925) Dr. de Pietra Santa details some experiments with fabrics—flannel, etc.—prepared with salicylate of bismuth. The intention was to make a fabric that should stand the ordinary treatment of washing, boiling, etc., and yet remain aseptic and retain antiseptic power against microbes. Bacteriology has revealed microbes everywhere; the object here is to make our ordinary clothing actively antiseptic. The antiseptic finally chosen was salicylate of bismuth, the history of salicylic acid and the salicylates generally being very favorable, but the salicylate of bismuth fulfilling best the conditions of an antiseptic that is inoffensive, insoluble, and without smell. The problem was to impregnate with this, in a lasting way, flannel, cotton, and every other fabric. "Two distinct operations assured the success of this: in the first, the tissues (or fabrics) are steeped in a solution of oxide of bismuth, whose absorbing properties they preserve; in the second, they are subjected to the action of salicylic acid, which plays the part of antiseptic *par excellence*. The salicylate of bismuth thus formed on the spot becomes incorporated with the very fibre of the tissue, maintaining in it those characters that resist prolonged washing in soap and water, no less than the influence of 120° C. in a disinfecting stove. Without entering into the details of the *modus faciendi*, we may state once more: (1) That certain chemical reagents (by their spots of different color) make it possible to recognize instantly in flannel or other tissue the presence of the two antiseptic and microbicidal substances in question: (2) that experiments with bacteriological cultures, repeated and well conducted, have proved that the salicylate of bismuth tissues have the property of preventing and of checking the multiplication of bacteria."

Of the experiments by M. Ferdinand Jean (Paris), this is the record: "Two tubes of glass, diameter 3 cm., length 20 cm., drawn out and sealed at one end, were completely filled—the one with flannel made aseptic by salicylate of

bismuth, the other with ordinary flannel. The two tubes, after being submitted to a current of steam, were closed, cooled, and then plunged into a watery solution formed by the maceration of a sheep's head in full process of putrefaction, the solution containing myriads of *bacterium termo.* The point of the tubes, which were broken under the liquid, allowed contact during forty-eight hours, and then two agar-agar plates (Pétri) were sown. At the end of six days, the plate sown with the liquid from the maceration with ordinary flannel was almost liquefied and invaded by countless colonies of microbes. On the contrary, the plate sown with the liquid from the maceration with the antiseptic flannel did not at this moment present a single colony of microbes. This experiment, then, proves the antiseptic and microbicidal action of flannel prepared with salicylate of bismuth." The experiments by Dr. Peytournean (Bordeaux) and Mons. H. Chambellan (Lyon) were somewhat more elaborate and exacting. Both experimenters conclude that the tissues thus treated with salicylate of bismuth are really antiseptic. "To sum up," adds Dr. de Pietra Santa, "we do not fear to say again that this discovery goes beyond the desires and aspirations of practical hygienists. It offers to impressionable and timid persons—who are legion—an easy, convenient, even an economical way of preventing the microbic infection suspended over their head like a Damocles' sword. This true antiseptic cuirass, which changes nothing in our habits or our prefer ences for this or that garment, makes it at last possible, in time of epidemic or threatening epidemic, to avoid the measures advocated for *isolation*, which is always difficult for families, and for *disinfection*, which is always inconvenient and costly."

VOLUNTARY AGE.—I am convinced that it is for a long time in every man's power to determine whether he will be old or not. The *outward* marks of age we are all of us very willing to defer; forgetting that we may wear the inward bloom of youth with true dignity and grace, and be ready to learn and eager to give pleasure to others to the latest moment of our existence.—*Sydney Smith.*

MORTALITY AND MORBILITY REPORTS.

By HARRY KENT BELL, M.D.

ALABAMA.—Jerome Cochrane, M.D., State Health Officer, Montgomery.

Mobile, 31,076: T. S. Scales, M.D., Health Officer, reports for the month of November a mortality of 55, of which 29 were colored, and 13 were under five years of age. The annual death-rate per 1000 was 21.60.

Zymotic diseases caused 6 deaths, and consumption, 6.

ARKANSAS.—John I. Hancock, M.D., President, Argentina; D. W. Holman, Secretary, Little Rock.

CALIFORNIA.—C. W. Nutting, M.D., President, Etna Mills; J. R. Laine, M.D., Secretary, Sacramento.

For the month of November the reports from 71 cities, towns, villages, and sanitary districts, aggregating a population of 763,723, show a mortality of 997—a death-rate of 15.00 per 1000 per annum.

There were 182 deaths from consumption, 103 from acute diseases of the lungs, 29 from diarrhœal diseases, and 75 from other diseases of the stomach and bowels, 21 from diphtheria and croup, 2 from whooping-cough, 29 from typhoid-fever, 7 from cerebro-spinal-fever, 50 from cancer, and 83 from heart disease.

Reports of prevailing diseases from 43 localities, outside of the larger towns and cities, give 263 cases of acute diseases of the lungs, 285 of diarrhœal diseases, 29 of diphtheria and croup, 15 of measles, 53 of *la grippe*, 62 of typhoid-fever, 153 of malarial fevers, 7 of cerebro-spinal-fever, 90 of tonsilitis, and 75 of pharyngitis. Whooping-cough epidemic at St. Helena and Etna Mills.

COLORADO.—A. Stedman, M.D., President, Denver; Henry Sewell, M.D., Secretary, Denver.

Colfax.—Denver, January 5th: Residents of the town of Colfax and the western part of the city of Highlands are becoming greatly alarmed over the prevalence of scarlet-fever in their midst. Although the Denver Health Department has no control over sanitary matters outside of the city, it will appeal to the State Board of Health and, if nothing else can be done, will insist upon the town being quarantined.

Health Commissioner Lemen, of Colfax, yesterday addressed a letter to Dr. Sewell, Secretary of the State Board of Health, urging his attention to the existing epidemic of scarlet-fever in the town of Colfax, and requesting him, as Secretary of the State Board of Health, to take immediate steps to prevent the spread of the contagion.

As far as the State Board's powers are concerned, under the statutes, it has absolute power to compel the observance of sanitary rules in any town of the State where health boards do not exist, or where the public health is endangered by neglect of sanitary measures. The difficulty is, however, that the Board is crippled for the lack of funds. It has acted for two years without compensation. Although $2500 was appropriated two years ago to carry on its work, the Board has never been able to secure a dollar of the amount by reason of the jugglery of those having charge of the appropriations.

CONNECTICUT.—Professor William H. Brewer, Ph.D., New Haven, President; Professor C. A. Lindsley, M.D., Secretary, New Haven.

The mortality report for November has been received from 165 towns in the State. There were 953 deaths reported in the State during the month. This was 41 less than in October, and 85 less than in November, 1893, and 42 less than the average number of deaths in November for the five years preceding the present. The death-rate was 14.2 for the large towns, 13.7 for the small towns, and 14.1 for the State. The deaths from zymotic diseases were 149, being 15.5 per cent of the total mortality. There were 106 deaths from consumption.

DELAWARE.—E. W. Cooper, M.D., President, Camden; E. B. Frazer, Secretary, Wilmington.

DISTRICT OF COLUMBIA, 250,000 : W. C. Woodward, M.D., Health Officer.

Mortality report for the three weeks ending January 5th, 322, of which number 140 were of colored people, and 85 were under five years of age. The annual death-rate was 18.9 per 1000. There were 45 deaths from zymotic diseases, and 46 from consumption.

Health Officer Woodward appeared before the Commissioners January 10th, and submitted as an item in his estimate for the suppression of contagious diseases, for the production of antitoxine for the treatment of diphtheria : Twelve horses at $40 each, $480 ; maintenance of ten horses at $10 per month each, $1200 ; bacteriologist, $1800 ; materials and apparatus, $320 ; total, $3800.

FLORIDA.—Hon. W. B. Henderson, President, Tampa ; Joseph Y. Porter, M.D., Secretary, Jacksonville.

The summary, as published in *Florida Health Notes* for the month of October, is as follows :

Number of counties reporting, 45 ; number of cities reporting, 3 ; total population of said counties and cities, 391,422 ; number of deaths reported, 306 ; death-rate per 1000 per annum, 9.16 ; number of deaths under five years of age, 83.

ILLINOIS.—William E. Quine, M.D., President, Chicago ; J. W. Scott, Secretary, Springfield.

Chicago, 1,600,000 : A. R. Reynolds, M.D., Commissioner.

The mortality for November was 1633, of which number 639 were under five years of age. The annual death-rate per 1000 was 12.25. There were 473 deaths from zymotic diseases, and 152 from consumption. Typhoid-fever caused 38 deaths ; diphtheria and croup, 232 ; scarlatina, 10, and small-pox 51.

Small-pox has broken out at the Roby race track. Three cases were taken in charge January 10th, and within the three or four days preceding as many more were sent into the city for treatment. The pest has already found lodgment among the jockeys and horse owners, the touts and the other hangers-on who sleep in the stables and other buildings. Commissioner Reynolds and other health officials admit the gravity of the situation.

INDIANA.—S. S. Boots, M.D., President, Greenfield; C. N. Metcalf, M.D., Secretary, Indianapolis.

Indianapolis, January 3d.—At the office of the Board of Health it is reported there are nearly four thousand cases of measles in the city. The physicians have been reporting forty and fifty cases a day for the last week, and the assertion is made that only one case in six is reported. The Board of Health has decided that it will prosecute all persons who fail to do their duty in this regard. It is believed that the measles epidemic is due to the failure to report cases, on account of which negligence many children from families having measles are permitted to attend the public schools.

Besides measles the alarming increase of other contagious diseases reported during the three days of the week beginning January 6th was the cause of this action. At 3 o'clock January 8th there had been 130 cases of measles, 10 of diphtheria, and 5 of scarlet-fever reported during the three days. During the last three months of 1894 the reports were respectively 147, 326, and 650 cases.

IOWA.—Frederick Becker, M.D., President, Claremont; J. F. Kennedy, M.D., Secretary, Des Moines.

The *Monthly Bulletin* reports for the month of October:

Cedar Rapids—November: Consumption, 1; pneumonia, 2; meningitis, 2; bronchitis, 3; accident, 1; poison, 1. Total deaths, 18.

Clinton—October and November: Diphtheria, 1; puerperal-fever, 1; consumption, 2; pneumonia, 1; bronchitis, 2; meningitis, 1; accidents, 2. Total deaths, 18.

Creston—November: Scarlet-fever, 1; typhoid-fever, 2; meningitis, 1; paralysis, 2. Total deaths, 7.

Des Moines—October: Diphtheria, 5; consumption, 5; tuberculosis, 2; typhoid-fever, 3; typho-malarial-fever, 2; puerperal-fever, 1; cholera infantum, 2; apoplexy, 2; appendicitis, 3; shooting, 1; railroad accident, 2; old age, 2. Total deaths, 63.

Dubuque—November: Consumption, 1; pneumonia, 2; tubercular meningitis, 1; cerebral meningitis, 1; apoplexy, 1; diphtheria, 2; membranous croup, 2; typhoid-fever, 1; cancer, 1; drowning, 1; railroad accident, 1. Total deaths, 29.

Ottumwa—November: Diphtheria, 3; typhoid-fever, 9; dysentery, 2; consumption, 3; pneumonia, 3; paralysis, 1; cancer, 1; accident, 1. Total deaths, 23.

So vigorous have been the protests made by the various cities against the revised ratio of population of those cities proposed in the last number of the *Bulletin* as a basis of computing their death-rate, such computation will be suspended until definite and more satisfactory information is received of their actual population by the State census, which is soon to be taken. The *Bulletin* will leave it with each city to establish its own death-rate.

KANSAS.—J. P. Stewart, M.D., President, Clay Centre; H. A. Dykes, M.D., Secretary, Topeka.

KENTUCKY.—Joseph M. Matthews, M.D., President, Louisville; J. N. McCormack, M.D., Secretary, Bowling Green.

LOUISIANA.—S. R. Oliphant, President, New Orleans; W. R. Harnan, M.D., Secretary, New Orleans.

New Orleans, 254,000 — 184,500 white, 69,500 colored. There were reported for five weeks ending December 29th, 819 deaths, of which number 310 were among the colored people, and 249 of children under five years of age. Annual death-rate per 1000, 33.85. Zymotic diseases caused 138 deaths, and consumption, 82.

MAINE.—C. D. Smith, M.D., President, Portland; A. G. Young, M.D., Secretary, Augusta.

Somersworth is having an epidemic of diphtheria attributed to bad sewerage, or *no sewerage at all.* A surface drainage to carry off accumulation of water after heavy rains is one thing; and a system of sewerage into which water-closets, bath-rooms, and sink-drains may empty is quite another thing. And unless active and prompt steps are taken to either put in a regular sewerage system, or compel those who are using the surface drainage for that purpose to discontinue its use, the epidemic is likely to increase.

MASSACHUSETTS.—H. P. Walcott, M.D., Chairman, Cambridge; S. W. Abbott, M.D., Secretary, Boston.

Boston, 501,107: S. H. Durgin, M.D., Chairman, reports for the month of November 897 deaths, of which number 279 were under five years of age.

The annual death-rate was 21.47 per 1000. From zymotic, including tubercular (203) diseases there were 400 deaths, of which 126 were due to diphtheria, 20 to typhoid-fever, 11 to scarlatina, 6 to whooping-cough. Of these diseases there were reported during the month: Diphtheria, 564; typhoid-fever, 123; scarlatina, 192; measles, 164.

During the year 1894 the number of deaths was 11,518, 22.98 per 1000 of population—501,107. Analyzing the various causes of death during the year, it is found that the respiratory diseases, as usual, account for by far the largest number of deaths of any single class. Including consumption, pneumonia, and bronchitis in this class, we find that they are accountable for 3020 deaths, or 26.2 per cent of the whole number. The next most important factor in the death-rate is heart disease, which alone caused 834 deaths. From diphtheria the number of deaths was 815, against 476 in 1893.

Taunton reports for the year 1894, 67 cases of scarlet-fever, from which there were 2 deaths. The largest number in a month was in March, when there were 11 cases. This is the smallest number of cases since 1891.

There were 174 cases of diphtheria during the year, from which there were 50 deaths. There were 10 cases in June, 18 in July, 14 in September, 46 in October, 40 in November, and 35 in December. This is the largest number of cases for the last ten years, the only year approaching the record being 1885, with 87 cases.

There were but 5 cases of typhoid-fever during the year, the smallest number for years.

Webster (January 4th) is stirred up by an epidemic of scarlet-fever. During the past few months there have been over 50 cases reported, and an unknown number that have not been reported, for Webster has many families who speak little English and do not understand the requirements of the law.

The acting board of health have done nothing to prevent the spread of the disease, excepting to put up the contagious disease placard on houses where the disease exists. Until recently they took no pains to see that houses were disinfected.

The schools have not been closed, and there the pupils have been exposed, until now the primary school in the Centre School has been closed out of necessity, as the teacher is seriously ill with scarlet-fever. The Superintendent of Schools has made vigorous protests against the careless manner in which the town board has neglected the epidemic. He has endeavored to keep close to the law as far as his own department is concerned, but has failed to have the co-operation of the town officials.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M.D., Secretary, Lansing.

The Secretary reports that for the month of December, compared with the preceding month, intermittent-fever, pneumonia, influenza, and tonsilitis increased, and typhoid-fever decreased in area of prevalence.

Compared with the average for corresponding months in the eight years 1886–93, scarlet-fever and diphtheria were more prevalent, and intermittent-fever, consumption, remittent-fever, pneumonia, and erysipelas were less prevalent in December, 1894.

Including reports by regular observers and others, consumption was reported present in Michigan in the month of December, 1894, at two hundred and twenty-nine places; scarlet-fever at one hundred and twenty-seven places; diphtheria at eighty-three places; typhoid-fever at sixty-nine places; measles at twelve places, and small-pox at ten places.

Reports from all sources show consumption reported at the same number of places; typhoid-fever at forty-seven places less; scarlet-fever at eighteen places more; diphtheria at three places less; measles at two places less, and small-pox at one place more than in the preceding month.

Detroit is in a most disgraceful state, small-pox and diphtheria prevailing epidemically, and the mayor, City Council, and Board of Health at loggerheads over sanitary measures. Mutual charges of incrimination have taken the place of sanitary effort, and each body politic is trying to rule the others. Meanwhile, the physicians of the city have held a meeting, formulated a bill to establish a board of health, of four members—two physicians and two laymen—for the city of Detroit,

and appealed to the State Legislature for action, with the apparent expectation of subordinating politics to sanitation by that means; by which they show need of familiarity with the most effective organizations for the protection of the public health in other cities.

At the end of the week ending December 21st, the latest of which we have a report, there were 42 cases of diphtheria in the city. Thirty new cases and five deaths had been reported during the week. Of scarlet-fever there were 22 cases existing, including 8 new cases. There were 13 cases of small-pox in existence, of which 9 cases developed during the week, and from which were 3 deaths. The total number of deaths for the week was 58, of which 22 were children less than five years of age.

MINNESOTA.—Franklin Staples, M.D., President, Winona; C. N. Hewitt, M.D., Secretary, Red Wing.

Minneapolis, 223,700: E. S. Kelley, M.D., Commissioner, reports for November 141 deaths, of which number 44 were under five years of age. The annual death-rate per 1000 was 9.45. From zymotic diseases there were 28 deaths, of which 10 were from typhoid-fever; and from consumption, 14.

St. Paul, 155,000: H. F. Hoyt, M.D., Commissioner, reports for November 130 deaths, of which 59 were under five years of age. The annual death-rate per 1000 was 10.05.

Zymotic diseases caused 22 deaths, and consumption, 4. There were 50 cases of contagious diseases reported.

MISSISSIPPI.—W. F. Hyer, M.D., President, Meriden; Wirt Johnson, M.D., Secretary, Jackson.

MISSOURI.—F. J. Lutz, M.D., President, St. Louis; William P. King, M.D., Secretary, Kansas City.

St. Louis, 540,000: George Homan, M.D., Commissioner of Health.

Kansas City, 124,000: R. P. Waring, M.D., Health Officer. The mortality for November was 110, of which 38 were of children under five years of age. The annual death-rate per 1000 was 8.66. Zymotic diseases caused 23 deaths, and consumption, 1.

At a meeting of the Board of Health, January 5th, Health Officer Waring reported for the year 1894: "Our death-rate is only 10.95 to the thousand inhabitants.

"Diphtheria is the only disease that has given us any trouble the past year. In the last two weeks there are fewer cases, and I hope the disease is abating. I am happy to say that the antitoxine has proved a wonderful remedy in this dread disease, and is now classed as a definite remedy that will generally cure if used early in the disease. In November we had thirteen deaths from diphtheria without serum, and in December we had only four deaths; and though the serum was applied, it was too late in the disease to cure, as it takes about twenty-four hours to have any special effect, and the patients died in from six to eight hours after it was used."

NEBRASKA.—J. V. Beghtol, M.D., President, Friend; F. D. Haldeman, M.D., Secretary, Ord.

NEVADA.—S. L. Lee, M.D., President, Carson City; J. A. Lewis, M.D., Secretary, Reno.

NEW HAMPSHIRE.—G. P. Conn, M.D., President, Concord; Irving A. Watson, M.D., Secretary, Concord.

NEW JERSEY.—C. F. Brackett, M.D., President, Princeton; Henry Mitchell, M.D., Secretary, Asbury Park.

Newark.—The Board of Health is in process of transformation, or, it may be, annihilation. The medical members of the Board have resigned, and the purpose of the city authorities is, according to the representation of the newspapers, to form a force of sanitary police, whose appointments will be placed in the hands of the Mayor and Police Commissioners. It is expected that the city will save at least $45,000 annually by the change. What it will lose by sickness and premature death is a matter of minor consideration

A resolution by the Common Council appropriating $5000 for the establishment of an antitoxine laboratory has been vetoed by the Mayor, on the ground that, according to *his* investigations, the value of antitoxine as given by eminent scientists abroad and prominent local physicians was not sufficiently established to justify the outlay.

Passaic Water Dangerous to Health.—The Board of Health, of Saddle River Township, after listening to complaints from residents along the bank of the Passaic River between Passaic and Paterson, N. J., has decided that the condition of the river is dangerous to health. They have asked the Boards of Health of the cities of Paterson and Passaic and the township of Acquackanonk to meet them to discuss a remedy. The river is dammed at Dundee, to furnish water-power for the Passaic Mills, two miles below. Since the building of the dam Paterson has trebled in population and manufactures, and discharges an enormous amount of sewage and factory waste into the stream. Much of this collects at the dam and causes smells which the neighboring farmers say are dangerous to health. Newark long ago refused to drink the polluted water of the river, and Jersey City continues to do so under protest.

Rahway is also disturbed by water pollution. December 23d: About two weeks ago J. J. Daly, M.D., the Mayor of Rahway, called the attention of the Board of Health to the bad taste of the water, and directed an investigation. The Board found that dams which are supposed to hold the refuse of the dye vats of the Bloodgoods Felting Mills were full to overflowing, the overflows entering the creek about a mile above the city's water-works. Immediate steps to remedy the evil were ordered, under penalty of the law against the pollution of streams.

NEW YORK.—F. O. Donohue, M.D., President, Syracuse; J. S. Barnes, M.D., Secretary, Albany.

New Members of the State Board.—Dr. Daniel Lewis, of New York, to succeed H. G. Walcott, Esq., of Fishkill; Dr. S. Case Jones, of Rochester, to succeed Dr. William E. Milbank, of Albany; Owen Cassidy, Esq., of Havana, to succeed Dr. John Edwards, of Gloversville.

The State Board *Bulletin* reports for the month of November that the reported mortality for the month has further decreased from the low daily average of 290 in October to one of 271; this is 10 less than that of the same month for the past three years, and the number of deaths is smaller than that of any month since November, 1889. This is uniformly the healthiest month in the year in this State, the average

daily mortality in November being at least 25 less than the daily average for the entire year. The death-rate was 15.10; in October it was 16.60, and in November, 1893, 15.35. Compared with November, 1893, the relative infant mortality is about the same, there having been fewer deaths under five years of age than in any month for several years. The zymotic mortality has fallen from 18.0 per cent of the total mortality in October to about 15.0, which is a little less than it was a year ago. The decrease is mainly in diarrhœal diseases, from which there were 500 fewer deaths than in October. From typhoid-fever there was also a diminished mortality, which is customary. Diphtheria is reported as causing 700 deaths, the same number as in November for the last two years; there were 150 more than in October, which is likewise true of the two preceding years; this increase is chiefly in the maritime district, but there is a larger mortality in all parts of the State, and its increased prevalence is reported from many places. Scarlet-fever caused 52 deaths, which is 20 more than in October, but fewer than have occurred in November for ten years; epidemics of mild scarlet-fever are reported from various parts of the State causing little fatality, there being but 5 deaths outside of the cities and populous towns; in the same rural communities there were 53 deaths from diphtheria. There were no deaths from small-pox outside the metropolis, but it developed the last of this month at Wawarsing and vicinity, originating from New York, and a number of cases have followed. Acute respiratory diseases caused fewer deaths than a year ago (1130). The temperature during the month was 3° below the average; there was a slight deficiency in rainfall, the relative humidity being about that of October. Winds were generally westerly, with high velocity.

New York, 1,925,562: Total deaths, 2788—899 under five years. Death-rate, 17.60. Zymotic diseases per 1000 deaths from all causes, 132.60. Deaths from consumption, 384.

The Statistical Bureau of the Health Department closed its records for the year 1894. Its figures show that during 1894 the death-rate was lower than during any year since 1814.

There were 41,212 deaths in this city during 1894, which in an estimated population of 1,957,452 gives a death-rate of

21.05 for every 1000 persons living. The Health Officers were highly pleased with the figures, as they indicate that the city has become more healthful than formerly, and they tend to show the efficiency of the department's work.

The records on file in the department show that during the past thirty years the population has increased 300 per cent, and the death-rate has been reduced by more than one third.

The death-rate in 1850 was 30.70; in 1865 it was 34.20, and in 1866, a cholera year, it was 35.04 per 1000.

The high death-rate led to the organization of the Health Department in 1866 for the purpose of caring for the city's health, providing proper methods of sanitation, and supervising the tenement and unhealthful districts in the city.

Prior to the organization of the Health Department, the city's sanitary condition was deplorable, and its high death-rate was a matter of general reproach. From a death-rate of 35.04, in 1866, it was reduced during the following twenty-two years to 25.23, and since that date has shown practically a continued decrease. It was 24.07 in 1889, 23.51 in 1890, 24.73 in 1891, 24.26 in 1892, 23.52 in 1893, and 21.05 in 1894. The grip prevailed in 1891 and 1892.

Taking the statistics by decades, the decrease is more marked. From 1849 to 1858 the death-rate averaged 34.26; from 1859 to 1868, 30.46; from 1869 to 1878, 27.94, and from 1879 to 1888 it was 26.68. There is a prospect of a much lower average during the present decade.

All contagious and infectious diseases have of late been treated in a manner that reduces their effects to as nearly a minimum as possible, and there is no reason to suppose that the city will again be scourged by cholera and yellow-fever, as it has been at times in the past.

According to the Health Department's method of computing the population of the city, there were 50,000 more people in the city in 1894 than in 1893, and yet 3000 fewer persons died. With the natural increase in population in the city, which is very marked in certain sections, where tenements are veritable beehives, the Health Department has done much good work. It has abolished nuisances and cleared disease-breeding spots, and has taught some of the foreign-born population how to care for themselves, and so prevent the spreading of disease.

Measles, typhoid-fever, malarial-fevers, and others have been reduced ; small-pox and typhus-fever are no longer bred here, and when they arrive from the outside they are at once taken and placed under control.

During the year there were 17,388 marriages recorded and 55,643 births.

The report of Dr. Charles F. Roberts, Sanitary Superintendent of the Board of Health, for the year 1894, shows among other things that there were 42,269 primary vaccinations and 183,203 revaccinations. The inspectors visited 19,803 tenement-houses, 5837 lodging-houses, 2494 private dwellings, 1566 other dwellings, 23 public buildings, and 502 other buildings.

The number of inspections made by the Division of Contagious Diseases was 75,479, while the Division of Pathology, Bacteriology, and Disinfection was 8557. The official chemist made 430,134 investigations.

Overcrowding received special attention during the year. There were 44,821 night inspections made.

The chemist during the year seized 6,893,021 pounds of milk, fruit, and foods, consisting chiefly of fish.

The Division of Bacteriology and Pathology diagnosed 7550 cases of diphtheria, of which 4046 were found to be true cases. Considerable attention was paid during the year to tuberculosis. Over 1000 suspects received attention.

Brooklyn, 1,012,200 : Total deaths for November, 1439—472 under five years. Death-rate, 17.35. Zymotic diseases per 1000 deaths from all causes, 175.00. Deaths from consumption, 184.

The Annual Report of Health Commissioner Z. Taylor Emery, M.D., from the time he took office, February 1st, to December 15th, 1894, exhibits the lowest death-rate that has been reported for Brooklyn, since the organization of the Health Department of the city on a scientific basis and the registration of vital statistics was first undertaken with an effort to approximate accuracy and fulness.

George E. West, Secretary, in charge of the Registration Department, reports as follows :

During the eleven months ending November 30th, 1894, there were reported to this bureau 5634 marriages, 18,205

births, 1533 still-births, and 19,485 deaths. Except in the case of the deaths these returns are all too incomplete to serve as data for valid inductions. Estimating the average population of the city for the year at 1,045,000, the annual death-rate, calculated from the returns for eleven months, is 20.4 as against a rate of 21.5 for the corresponding period of last year. It can be safely asserted that the death-rate for the year will be below 21 per 1000 for the first time since this bureau was established. Had it not been for the annexation of the towns of Flatbush, New Utrecht, and Gravesend, the result would have been even more gratifying, for the estimated population would then have been 1,023,000, and the deaths 18,591, giving a rate of 19.9. Of the deaths reported, 10,273 were of males, and 9212 of females. By classes, 4628 deaths were due to zymotic causes, 3793 to constitutional, 8986 to local, 1383 to developmental, and 695 to violent. Of children under five years of age, there were 8638 deaths, or 44.3 per cent of the total, and of children under one there were 5315 deaths, or 27.3 per cent of the total. The principal causes of death were: Consumption, 2053; pneumonia, 1931; diphtheria, 1141; nephritis, 1056. There were also 331 deaths from croup, most of which should probably be reckoned as diphtheria. Of the total deaths 9852 occurred in tenements, 2292 in institutions, and 362 were of colored persons.

Of contagious diseases the cases and deaths reported, with the percentage of the latter to the former, are given in the following table:

	Cases.	Deaths.	Per Cent.
Small-pox	453	95	21
Measles	4,634	199	4
Scarlet-fever	1,979	182	9
Diphtheria	3,268	1,141	35
Typhoid-fever	250	147	59

For the corresponding period of 1893 there were:

	Cases.	Deaths.	Per Cent.
Small-pox	378	111	29
Measles	2,141	101	5
Scarlet-fever	2,771	296	11
Diphtheria	1,502	560	37
Typhoid-fever	205	165	80

The uniformly smaller percentage of deaths to reported cases this year as compared with last probably indicates that these diseases were all more fully reported this year rather than that they were of a milder type. Although more cases of small-pox were reported this year than last, it has ceased to be epidemic since June. Measles, too, has fallen off to practical insignificance. Diphtheria alone shows at present a tendency to increase.

No student of vital statistics will fail to observe in the defects to which the registrar alludes, the remarkably small number of marriages and births reported for such a population, and the proportionally large number of still-births to the living. These defects are explicable by the habitual negligence of clergymen and magistrates to report marriages, of physicians to report births, and of the Department of Health to enforce its ordinances—no less explicit in regard to these matters than they are to the report of deaths.

By the courtesy of the department, the writer has been privileged to examine the reports of births for a lengthy period. They are remarkable throughout for the relative proportion reported by physicians and midwives, there being more than twice as many reported by the latter as by the former, except of still-births, of which the physicians report twice as many as the midwives. There are doubtless more than twice as many physicians as midwives in Brooklyn, and more than twice as many births attended by them as by the midwives; but the midwives are more obedient to the law, and in this respect they merit their classification as physicians, under the law, while there are no requirements with regard to their competency. Probably not one in a hundred of them could give the average dimensions of the female pelvis, or the technical distinctions of complicated from normal labor. That there should be a large proportion of "still-births" reported at such hands is by no means surprising. That there should be a still larger proportion reported by physicians is, because they disregard the ordinance to report other births—the still-births they are constrained to report, because they are deaths. But what say the *ordinances?*

"§ 152. That every clergyman, magistrate, and other person who may perform a marriage ceremony, shall make and

keep a registry of the marriage celebrated, and therein enter the full names of the parties married, and the residence, age, and condition of each; and every physician, midwife, and other person who may professionally assist or advise at any birth, shall make and keep a registry of every such birth, and therein enter the time and place, ward and street, number of such birth, and the sex and color of every child born, and the names and residence of each of the parents (so far as the foregoing facts can be ascertained); and every physician and professional adviser who has attended any person during a last illness, or has been present by request at the death of any person, shall make and preserve a registry of deaths, stating the cause thereof, and specifying the date, hour, place, and street number of the place of such death.

"§ 153. That it shall be the duty of every person mentioned in the last section, or required to make or keep any such register, to present to this department a copy of such register, signed by such person, or a written statement, by him signed, of all the facts in said register required to be entered, within five days after the birth or marriage, and within thirty-six hours after the death of any person to whom such registry may or should relate, which shall thereupon be placed on file with this department.

"§ 183. *That every person shall obey the ordinances, rules, regulations, and orders of this department, made or to be made in pursuance of the act of the Legislature of the State of New York, under which these ordinances are adopted.*

"§ 184. *That any person who omits, neglects, or refuses to comply with, or who resists any of the provisions of the foregoing ordinances, or who refuses or neglects to obey any of the rules, orders, or sanitary regulations of the Department of Health of the city of Brooklyn, or who omits, neglects, or refuses to comply with, or who resists any order or special regulation of the said Department of Health of the city of Brooklyn, shall be guilty of a misdemeanor, and liable to arrest, suit, and prosecution therefor, and upon conviction of such offence, shall be punished by imprisonment in the county jail, not to exceed thirty days, and by fine not exceeding two hundred dollars, nor less than ten dollars, or by both such fine and imprisonment.*"

So far as appears from the records of the department there seems never to have been any effort made to obtain such reports—indeed, no appreciation of the importance of them to the present generation or to their descendants.

The Commissioner, and Dr. Morton Expert in Contagious Diseases, justly felicitate themselves and the public on the success of the effort to stamp out small-pox, which threatened

to become epidemic, and was the cause of 95 deaths, at the small expense of $27,041.14; while they only recognize the continued persistence of diphtheria, which killed more than fifteen times as many persons as small-pox during the year—as it has, indeed, annually for a dozen years—and yet without any apparent effort of the Health Department to stay its progress! Just now the department is taken up with the antitoxine *treatment* of the disease, while it is purblind to the culture-beds that maintain it.

The organization of the department has been considerably improved under Dr. Emery, by the creation of the Bureaus of Contagious Diseases and Bacteriology; by the reorganization of the Bureau of Plumbing, and by the addition of a steam disinfection plant, insomuch that the department is better prepared for aggressive work than it has ever before been, and it is quite safe to say that if it should display the same amount of energy against the culture beds of diphtheria during the current year as it displayed against the unvaccinated during the last, it and the public would reap a more than corresponding satisfaction and benefit.

WILLIAM PAUL GERHARD, C.E., of New York, has been appointed Honorary Consulting Engineer to the department.

PUTRID POULTRY.—

DEPARTMENT OF HEALTH, BROOKLYN, N. Y.,
January 4, 1895.

Hon. Z. Taylor Emery, M.D., Commissioner of Health:

SIR: I have completed some experiments in regard to the relative time at which decomposition becomes pronounced in fowl which have and fowl which have not been eviscerated. A number of fowl were killed by a dealer and half of them cleaned by him, the others not being eviscerated, but all being plucked. The bodies were kept side by side in a room under like conditions of temperature and ventilation. Decomposition pronounced by odor and discoloration began uniformly in the uneviscerated fowl at least two days before being noticed in the others. The tainting of the muscular tissue from the presence of the intestinal contents is pronounced for some time before discoloration or odor is perceptible.

E. H. WILSON, M.D., *Bacteriologist.*

Syracuse, 91,944: Total deaths for November, 108—29 under five years. Death-rate, 14 10. Zymotic diseases per 1000 deaths from all causes, 194.40. From consumption, 15.

Albany, 98,000: Total deaths, 132—45 under five years. Death-rate, 16.16. Zymotic diseases per 1000 deaths from all causes, 144. From consumption, 16.

Buffalo, 300,000: Total deaths, 354—125 under five years. Death-rate, 14.64. Zymotic diseases per 1000 deaths from all causes, 250. From consumption, 41.

Rochester, 150,000: Total deaths, 165—35 under five years. Death-rate, 13.20. Zymotic diseases per 1000 deaths from all causes, 127.25. From consumption, 32.

Oneonta.—O. W. Peck, M.D., Health Officer, reports for the year 1893 a total of 116 deaths, of which 33 were under five years of age. There were 12 deaths due to zymotic diseases, and 9 to consumption. Death-rate per 1000, 13.92.

NORTH CAROLINA.—H. T. Bahnson, M.D., President, Salem; Richard H. Lewis, M.D., Secretary, Raleigh.

From the *Bulletin* of the State Board of Health we find that during November there were 130 deaths in 30 towns, aggregating 147,454 population; 70 were of colored people, and 30 were of children under five years of age.

The annual death-rates were 8.3 per 1000 for the white population, 12.2 for the colored population, and 10.6 for the total. There were 12 deaths from consumption, 3 from typhoid-fever, 6 from pneumonia, and 5 from diarrhœal diseases.

Asheville, 12,000: Total deaths, 6. Annual death-rate, 6 per 1000.

Charlotte, 14,000: Total deaths, 12. Annual death-rate, 12.1 per 1000.

Raleigh, 15,000: Total deaths, 15. Annual death-rate, 12.0 per 1000.

Wilmington, 22,000: Total deaths, 23. Annual death-rate, 14.5 per 1000.

NORTH DAKOTA.—Hon. W. H. Standish, President, Bismarck; F. H. DeVaux, M.D., Superintendent, Valley City.

OHIO.—Byron Stanton, M.D., President, Cincinnati; C. O. Probst, M.D., Secretary, Columbus.

Toledo, 120,000: J. Wood, M.D., Health Officer, reports for November a mortality of 139, of which 33 were under five years of age, representing an annual death-rate of 13.90 per 1000. There were 28 deaths from zymotic diseases, and from consumption, 12.

Ashtabula, December 27th.—The epidemic of diphtheria was declared off, and the Board of Health adopted the following resolution:

"Whereas, since December 22d, 1894, there has been no new case of diphtheria in the city outside of families where it previously existed, and whereas in the opinion of the Board of Health of the city of Ashtabula the epidemic which began on December 6th, 1894, is now practically at an end; be it therefore

"Resolved, That in the opinion of said Board all ordinary public meeings may be resumed without risk or danger."

Canton, December 24th.—An outbreak of diphtheria has been attributed to a milk supply. Dr. Probst, Secretary of the State Board, on investigation found that the spread of the disease was not due to the use of the milk, though there was good ground to believe that the contagion was carried by milk tickets.

OKLAHOMA TERRITORY.—L. L. Parker, President, Kingfisher; C. D. Arnold, M.D., Secretary, El Reno.

PENNSYLVANIA.—S. T. Davis, M.D., President, Lancaster; Benjamin Lee, M.D., Secretary, Philadelphia.

January 14th, 1895.—The Secretary reports the following, adopted at a special meeting of the State Board, January 12th:

"Whereas, There has been for several months past a more than usual prevalence of small-pox in many cities of the United States, and among them in the city of Philadelphia, and,

"Whereas, Said disease has recently found its way from the city of Philadelphia to three different points in this State continguous to said city, therefore

"Resolved, That, while in the opinion of this Board, the energetic measures employed by the Philadelphia Board of

Health, in providing for and urging general vaccination and enforcing the rigid isolation of all cases, will, if seconded by the intelligent and ready co-operation of citizens, prevent the disease from becoming epidemic,

"Nevertheless, For the absolute protection of communities adjacent to or liable to constant intercommunication with the city, this Board recommends and strongly urges upon the health authorities of all such communities and also upon all heads of families a general and prompt resort to vaccination and re-vaccination."

Philadelphia, 1,139,457: M. Veale, Health Officer, reports: In the five weeks ending December 29th there were 2024 deaths, of which number 635 were under five years of age. Annual death-rate, 18.51 per 1000. Deaths from consumption numbered 240; from zymotic diseases, 344.

December 27th there were 30 cases of small-pox in the Municipal Hospital and 10 cases in the city besides.

To Enforce Vaccination.—The Board of Education, December 27th, ordered as follows:

"Resolved, That the rule of the Board of Public Education which requires every pupil attending the public schools to furnish a medical certificate of successful vaccination or other satisfactory evidence of immunity from small-pox shall be strictly enforced;

"Provided, That when any evidence of immunity from small-pox is offered other than a successful vaccination, it shall be explicitly stated in the certificate. In cases not protected by an attack of varioloid or small-pox, a re-vaccination shall be required, and if unsuccessful a certificate to this effect shall be accepted and the child shall be allowed to attend school, but before entering any subsequent September term another certificate will be required."

Pittsburgh, 272,000: J. Guy McCandless, M.D., Registrar, reports: During the five weeks ending December 29th there were 459 deaths, of which 185 were under five years of age. Deaths from zymotic diseases, 61; consumption, 41. Annual death-rate, 17.53.

January 11th: Typhoid-fever is epidemic in the East End. Since January 1st 110 have been reported to the Bureau of Health, and over half of them are in the East Liberty Valley.

The number of deaths reported is not large yet, as most of the cases are new ones and have not yet reached the stage where death usually occurs.

Only 10 deaths from typhoid-fever have been reported thus far this year, but these were from cases which were reported during December. One hundred and twenty-one cases were reported during that entire month, and that number was considered very large. In the first nine days of January the number almost equals that for the thirty-one days of December. The Health Officers are puzzled as to the cause of the epidemic. An attaché of the Health Bureau said they could not explain the outbreak of the disease at this time, as it usually gets bad only in the late summer and fall. Neither could he offer any suggestion of the cause of the disease being so much worse in the East End than anywhere else.

Fifteen cases of typhoid were reported yesterday, of which 3 were in the Fourteenth Ward, 3 were down-town, and 4 in the East End. Day before yesterday there were 20 cases, 12 of them in the East End. Every day since January 1st about half the cases have been in the East End. Last month there were 17 deaths from typhoid-fever in this city, and the same month a year ago only showed 13 deaths, an increase of 4 for the same period. The record of last month is also the greatest for this season.

RHODE ISLAND.—A. G. Sprague, M.D., President, River Point; Gardner T. Swarts, Secretary, Providence.

SOUTH CAROLINA.—J. R. Bratton, M.D., Chairman, Yorkville; H. D. Fraser, M.D., Secretary, Charleston.

Charleston, 82,870 white, 36,295 colored: 65,165: H. B. Horlbeck, M.D., Health Officer, reports for the five weeks ending December 29th, deaths, 165—46 colored. Deaths under five years, 58. Annual death-rate, 25.40. Zymotic diseases, 17; consumption, 21.

SOUTH DAKOTA.—C. B. Alford, M.D., President, Huron.

TENNESSEE.—J. D. Plunkett, M.D., President, Nashville; J. Berrien Lindsley, M.D., Secretary, Nashville.

The principal diseases, named by the *Bulletin* in the order of their greater prevalence, in the State for the month of November were typhoid-fever, lung diseases, acute, malarial-fever, scarlet-fever, diphtheria, consumption, whooping-cough, measles, croup, rheumatism, *la grippe*, chicken-pox, mumps, and dysentery.

Chattanooga, 40,000 : Total deaths, 41—colored, 28. Annual death-rates per 1000, white, 5.77 ; colored, 25.88 : total, 12.30.

Knoxville, 40,385 : Total deaths, 58—colored, 26. Annual death-rate per 1000, white, 12.27 ; colored, 34.23 : 17.23.

Memphis, 57,951 : Total deaths, 110—colored, 64. Annual death-rates per 1000, white, 17.04 ; colored, 30.02 : 22.77.

Nashville, 87,754 : Total deaths, 100—colored, 55. Annual death-rates per 1000, white, 19.89 ; colored, 19.89 : 13.67.

Scarlet-fever has been unusually prevalent in this city since early in November. There were 23 cases during the month, and 30 cases in December up to the 27th.

TEXAS.—R. M. Swearingen, M.D., State Health Officer, Austin.

UTAH TERRITORY.

Salt Lake City, W. T. Dalby, M.D., Health Commissioner.

VERMONT.—C. S. Caverly, M.D., President, Rutland ; J. H. Hamilton, M.D., Secretary, Ritchford.

VIRGINIA.—R. W. Martin, M.D., President, Chatham ; A. Irving, M.D., Secretary, Richmond.

WASHINGTON.—J. R. Hathaway, M.D., President, Everett ; G. S. Armstrong, M.D., Secretary, Olympia.

WEST VIRGINIA.—W. P. Ewing, M.D., President, Charleston ; N. D. Baker, Secretary, Martinsburg.

WISCONSIN.—J. W. Hancock, M.D., President, Ellsworth ; U. O. B. Wingate, M.D., Secretary, Milwaukee.

Milwaukee, 270,000 : W. Kempster, M.D., Commissioner,

reports for November a mortality of 331, of which 139 were under five years of age.

Cases of infectious diseases reported : Diphtheria, 48 ; scarlet-fever, 10 ; small-pox, 146 ; typhoid-fever, 20 ; admitted to City Isolation Hospital, 57.

Deaths from diphtheria and croup, 29 ; typhoid-fever, 6 ; diarrhœal diseases, 8 ; consumption, 20.

PROVINCIAL BOARD OF HEALTH OF NEW BRUNSWICK.—William Bayard, M.D., Chairman, St. John ; George E. Coulthard, M.D., Secretary, Fredericton.

PROVINCIAL BOARD OF HEALTH OF NOVA SCOTIA.—Hon. W. S. Fielding, Premier and Provincial Secretary, Chairman ; A. P. Reid, M.D., Secretary, Halifax.

PROVINCIAL BOARD OF HEALTH OF ONTARIO.—John Duff Macdonald, M.D., Chairman, Hamilton ; Peter H. Bryce, M.D., Secretary, Toronto.

PROVINCIAL BOARD OF HEALTH OF QUEBEC.—E. P. Lachapelle, M.D., President, Montreal ; Elzear Pelletier, M.D., Secretary, Montreal.

Reports of the Provincial Boards of Health for the month of January show the following : Deaths from diphtheria, 88 ; scarlet-fever, 61 ; typhoid-fever, 25.

MANITOBA.—John H. O'Donnell, M.D., Chairman, Winnipeg ; C. J. Jamison, M.D., Secretary, Winnipeg.

SUPERIOR BOARD OF HEALTH OF MEXICO. — Eduardo Dicéaga, President, Mexico ; José Ramirez, M.D., Secretary-General, Mexico.

BUENOS AYRES, 580,371 : Albert B. Martinez, Director-General of Municipal Statistics.

MEDICAL EXCERPT.

By T. P. Corbally, A.M., M.D.

THE REAL VALUE OF THE MEDICINAL PEROXIDE OF HYDROGEN PREPARATIONS FOUND IN THE MARKET.—H. Endemann, Ph.D., Chemist, formerly with the Health Department of New York City, reports in the *Times and Register, December 15th*, 1894, the following results of an examination which he has recently made of all the brands of peroxide of hydrogen which he could find on the market, in order to ascertain the real value of each when intended to be used as an antiseptic remedy, both internally and externally.

These brands have been tested for the volume of available oxygen, the amount of residue, the degree of acidity, and the amount of soluble baryta salts contained therein, as per following table:

Brands.	Volume of Available Oxygen, determined by means of a solution containing 5.665 Grammes of Permanganate of Potash per litre of distilled water.	Residue obtained from 100 C. C. of Peroxide of Hydrogen dried at 120°C.	Acidity expressed in Cubic centimetres of Normal Volumetric Soda Solution for 100 C. C. of Peroxide.	Baryta found in Soluble Baryta Salts contained in 100 C. C. of Peroxide.
No. 1. John Bene's Peroxide of Hydrogen Medicinal	10.50	0.1886	2.19	None.
No. 2. Hydrozone	27.35	0.2180	3.11	None.
No. 3. Larkin & Scheffer's Peroxide of Hydrogen Medicinal	9.65	0.1206	0.75	None.
No. 4. Mallinckrodt's Peroxide of Hydrogen Medicinal	9.55	0.1408	1.43	None.
No. 5. Marchand's Peroxide of Hydrogen Medicinal	16.35	0.564	1.29	None.
No. 6. McKesson & Robbins' Peroxide of Hydrogen Medicinal	10.95	0.0540	0.44	None.
No. 7. Merck & Co.'s Peroxide of Hydrogen Medicinal	0.50	0.2418	4.57	None.
No. 8. Oakland Chemical Co.'s Peroxide of Hydrogen Medicinal	10.50	0.0382	0.34	0.0017
No. 9. Peuchot's Peroxide of Hydrogen Medicinal	10.60	0.4674	1.77	0.0018
No. 10. Powers & Weightman's Peroxide of Hydrogen Medicinal	8.40	0.0830	2.03	None.
No. 11. Pyrozone, 3 per cent	11.20	0.0534	0.76	None.
No. 12. Rosengarten & Sons' Peroxide of Hydrogen Medicinal	3.10	0.1002	0.25	None.
No. 13. Smith, Kline & French Co.'s Peroxide of Hydrogen Medicinal	6.15	0.0880	2.6	None.
No. 14. E. R. Squibb's Peroxide of Hydrogen Medicinal	12.40	1.004	12.04	None.

By referring to this table it is easily understood that sample No. 2, "Hydrozone," is far superior to any other brand which has ever been made, not only on account of its containing a much larger amount of available oxygen, but also owing to the presence of a small quantity of several essential oils, the respective nature of which could not be determined, very likely because they have been submitted to the oxidizing action of peroxide of hydrogen before being used to make "hydrozone."

I attribute to this small quantity of essential oils the great superiority of hydrozone over any other brands of H_2O_2 as a healing agent.

When hydrozone is diluted with distilled water, in the proportion of half and half, the resulting mixture contains about 13.5 volumes of available oxygen, and its bactericide power still remains the same as the bactericide power of sample No. 5, which contains 16.55 volumes of available oxygen.

Sample No. 14 comes next to sample No. 5, but it is readily seen that the degree of acidity is entirely too large for a preparation which is to be applied to the most sensitive diseased mucous membranes.

Sample No. 11, called "Pyrozone," which contains 11.20 volumes of available oxygen, is quite similar to sample No. 6, with the exception that the latter contains a small quantity of salicylic acid. Very likely the salicylic acid has for its object to increase the bactericide power, but, unfortunately, I fear that it impairs the keeping properties of this preparation.

ACIDITY.—The fourteen brands which I have examined contain free acids (phosphoric, sulphuric, muriatic); and I must say that peroxide of hydrogen medicinal should never be made neutral before using, even in the most delicate cases. Neutral peroxide of hydrogen rapidly decomposes under all conditions of exposure.

The keeping properties of H_2O_2 solutions vary a great deal with the degree of purity and the percentage of free acids contained therein.

If the proportion of acid is too large, the profession well know that it acts as an irritant upon diseased surfaces. If it is too small, the solution don't keep well.

My opinion is, that a standard solution of medicinal H_2O_2 must answer the following tests :

1. It should contain at least 15 volumes of available oxygen.

2. The quantity of free acids contained in 100 cubic centimetres should require not less than 1 c.c. and not more than 3 c.c. of normal volumetric soda solution, to be made neutral. Such a small quantity of free acid is not objectionable.

3. It should not contain any soluble baryta salts.

4. It must be free from sediment.

It is to be noticed that the brands No. 7 and No. 12 are valueless.

The brands No. 8 and No. 9 are not fit for medicinal uses, owing to the fact that they contain traces of soluble baryta salts.

The brand No. 3 has a heavy sediment of sulphate of baryta, which may be considered inert toward the system, but it is certainly detrimental to the keeping qualities of this preparation.

Brand No. 14, which is sold as a 10-volume solution, is really 12 volumes, but it is too acid. Brand No. 5, which is sold as a 15-volume solution, is really 16.55 volumes—viz., about 10 per cent above the standard.

The brand No. 2, which is sold without any mention of volume, is really a 27.35-volume solution—viz., 90 per cent above the standard.

None of the other brands come up to the standard, but, on the contrary, they run from 35 to 55 per cent below.

25 William Street, New York City.

ANTISEPTIC PROPERTIES OF THE VAPORS OF FORMIC ALDEHIDE.—M. Taillat presented a communication to the Académie de Médecine (*La France Médicale*, October 12th), in part as follows : " In 1894, describing the use made of the antiseptic properties of the vapors of formol, I stated that disinfection may be obtained by the employment of this agent, either solid or in the liquid or gaseous form. I afterward proved, acting with Dr. Berlioz, that the action of air impregnated with formol was a disinfectant of the bacilli in the saliva, of the bacilli of decomposing substances, of the *bacillus anthracis*, the bacillus of Eberth, the coli-bacillus, etc. Finally,

I showed that the immediate neighborhood of a cloth moistened with a weak solution of formol is capable of arresting the putrefaction of meat, and I described a process of disinfection based on this property.

"This process, although simple, presents some inconveniences, and chiefly that of obliging those using it to procure formol. I have made the following experiments with the apparatus used for the production of formol, but very much reduced in size and having a few modifications.

"The apparatus is in the form of a pulverizer or of a kind of lamp; it will change in the day as much as five kilogrammes of methylic alcohol into the vapor of formol. The production of formol is about 25 per cent. of the alcohol burned.

"In the first series of experiments I endeavored to know (1) if the antiseptic action of the vapors produced by the apparatus in a room was as effectual in the lower as in the upper part; (2) what would be the duration of the action necessary to destroy the germs; (3) the quantity of alcohol burned. I constructed a small scale, on which is found, at different heights, plates containing the sweepings of the hospital, previously dried, so as to compare the experiments. The apparatus for the formol being placed in containers of different capacity, varying from twenty to three hundred cubic metres, was in action during a definite period of time, the preparative measures were complete, the material placed in bouillon, and then put aside for observation during fifteen days. *Results:* The action of the vapor was equally active on the lower part as on the upper portion of the scale; in a room having a capacity of twenty cubic metres the germs were destroyed in eight hours; the weight of methylic alcohol burned was two hundred grammes; in a room of three hundred cubic metres the same result was obtained in twenty-four hours. Weight of alcohol burned, two kilogrammes.

"In a second series of experiments I have studied the influence of moisture on the antiseptic action of the vapor; the sweepings before mentioned were moistened for that purpose with quantities varying from 3 to 20 per cent of water. *Results:* the presence of water retards the antiseptic action of the formol in proportion to the degree of humidity.

"In a third series of experiments I smeared, with a sub-

stance rich in bacteria of all kinds, the walls, the drapery, and the different objects in the room ; after each experiment the sweepings were collected and placed in sterilized bouillon. *Results of one experiment :* Duration of the action of the apparatus, ten hours ; capacity of the room, fifty cubic metres ; quantity of alcohol burned, 0 kil. 650. The bouillons in which the contaminated dustings were placed remained clear for fifteen days.

" The following typical experiment deserves special notice, and gives a summary of all the other experiments :

" In a sick-room containing forty-five cubic metres, and retaining all its furniture, drapery, curtains, and other articles of every kind, the apparatus for producing formol was set in action during four hours only. After that time I added to pure bouillon the matter swept from the ceiling, from the floor, and from the different objects in the room ; in other vessels containing bouillon I placed little squares of paper, of cloth, pieces of wood which had been steeped in bouillon rich in bacilli obtained from suppurations or smeared with sputa from tuberculous patients. All these bouillons remained clear after fifteen days ; some that had been carefully watched were seen to be slightly turbid after twenty days.

" In this experiment pieces of cloth and of paper were penetrated through their whole substance with the vapor of formol, and I found that the vapor had penetrated the wood for a perceptible distance.

" I found no injury done to metals, to cloth, nor to surgical instruments. I found, however, that silks dyed with the derivatives of rosaline became slightly violet ; those dyed with certain nitrogenous substances became slightly yellow. This change did not arise from a discoloration, but from a transformation of the coloring matter.

" As to the persistence of the odor, I found that it does not remain if a strong current of air be passed through the room. It disappears rapidly if strong ammonia be exposed in the room. These experiments, the details of which will be published separately, as they do not belong to the regular work of the laboratory, are necessarily somewhat imperfect, but they show in a most striking manner the energy of the antiseptic action of the vapors of formol, and the facility of disinfecting

by the use of the apparatus for the direct production of the vapor of formol."

CANCER OF THE COLON—ITS RADICAL TREATMENT.—M. Demons presented two cases to the Sociéte de Chirurgie recently (*La France Médicale*, October 19th). The diagnosis of cancer of the colon is often very difficult; and, besides, the lesion is often far advanced when measures for its removal are undertaken and the operation is much more serious. Exploratative laparotomy may, then, be indicated from the time when the possibility of the existence of cancer of the colon is suspected.

The ideal intervention—that is to say, the total removal of the diseased intestine and the uniting by suture of the two intestinal rings that have been divided, is the result to be desired.

"I have been obliged to operate twice for cancer of the colon.

"I. A woman, thirty-six years of age, had in the right flank a painful tumor, which was supposed to be a movable kidney. Laparotomy was performed in order to make a nephropexy, and, in the course of the operation, a cancer of the ascending colon was found. This tumor was removed, and with it the cæcum, and an enteroraphy was performed, but without using the process of Murphy. A fistula still exists. The patient continues without any symptoms of relapse, although a swelling in the deep tissues is distinctly felt.

"In two cases of gastrotomy I used Murphy's method, and both patients died of peritonitis on the eighth day after the operation.

"II. A woman, sixty years of age, had a cancer in the left iliac fossa. Laparotomy was performed, and a tumor of the sigmoid flexure of from ten to twelve centimetres in height was found. The tumor was removed and the ends of the intestine joined to the abdominal walls. Six months later the artificial anus was closed, and the patient is still without signs of a relapse.

"This method is more certain of success than the ideal one but it exposes the patient to the inconvenience of the artifi cial anus, which may persist for many months."

THE BUBONIC PEST IN HONG KONG (*Journal d'Hygiène*, October 11th).—We have already directed attention to the epidemic of that deadly *plague* known as bubo, which has ravaged the Chinese population of Canton and Hong Kong since the end of the month of March last; and our excellent correspondent, Dr. Ernest Martin, in an article, "La Peste en Asie" (*Journal d'Hygiène*, July 19th last), fully summarized the known facts and the correct ideas which we now possess regarding this terrible scourge.

As additional documents, we publish to-day the substance of two notes on their bacteriological character which appeared in the *Bulletin Medical;* the former by Dr. Yersin, the other by Professor Kitasato.

I. According to Dr. Yersin, physician to the mission colonies: "The pest is a contagious and an innoculable disease. It is probable that the rats constitute the principal vehicle for diffusing it, but I have also determined that flies contract the disease, and die of it, and may be the means of transmitting it to human beings.

"As might reasonably be expected, the older of the preparators of the Institut Pasteur found it necessary to look for 'the existence of a microbe in the blood of the patients and in the substance of the bubos.' The results, according to him, were of the most decided character.

"The substance of the bubo is, in all cases, filled with a seething mass of short bacilli, thick, with rounded extremities, easily colored with aniline dyes, but not colored by the process of Gram. This bacillus is found in great quantities in the bubos and in the ganglions of the patients.

"The blood contains them also, but in much less abundance; they are not found in it except in very severe cases, and those are rapidly fatal."

II. Professor Kitasato, according to the notes of his autopsies, made at Hong Kong in company with Professor Aoyama, thus describes the bacillus of the pest:

"The bacilli are found in the blood, in the bubos, in the spleen, and in all the other internal organs of the patient. They are in the form of wands, with rounded extremities, which are more easily colored with aniline dyes than the middle portion, especially in preparations made with specimens from the blood.

"The bacilli found in the spleen are readily colored with a solution of methyl.

"The bacilli seem to have very little power of motion; they are most rapidly developed at a temperature of 36° to 39° Cent."

The following are the conclusions of the memoir of Professor Kitasato:

"It is known that, among the contagious diseases produced by bacilli, only two micro-organisms have as yet been discovered in the human blood; these are the bacillus of ulcers and the spirochel of pseudo-continued fever.

"In the blood of human beings suffering with the bubonic pest we find a new bacillus having the following characteristics:

"1. This bacillus is found in the blood, in the bubos, and in the internal organs of patients suffering with the pest.

"2. This bacillus is not found in any other contagious disease.

"3. With this bacillus it is possible to produce in animals symptoms the same as those found in man afflicted with the plague.

"From what precedes, we must conclude that this bacillus is the *cause* of the disease known as *pest bubonique*, and that, consequently, this bubonic pest is a *contagious disease produced by a specific bacillus.*"

The question is now, before casting aside all the previous clinical and epidemiological notions held regarding this plague, to determine precisely by what channels this bacillus is introduced into the human body.

EUROPHEN AS A SUBSTITUTE FOR IODOFORM.—Although iodoform is regarded as an excellent agent for local application in syphilitic and tubercular affections, such as ulcers, and also in wounds, still its odor has always been so objectionable that its use in private practice has been to a great extent abandoned. We notice in "White's Materia Medica," edited by Professor R. W. Wilcox, of New York, a second edition of which has just been published by P. Blakiston, Son & Co., that europhen is used for like purposes and in the same quantities as iodoform. It is without any disagreeable odor, and seems to possess the advantages of iodoform without its disadvantages.—*Brooklyn Medical Journal, December*, 1894.

EDITOR'S TABLE.

SANITARIAN, FEBRUARY NUMBER, 1895.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

NEW YORK TENEMENT-HOUSES.

THE Tenement-House Committee, consisting of Richard Watson Gilder, Health Commissioner Cyrus Edson, Roger Foster, Solomon Moses, George B. Post, John P. Schuchman, and William D'H. Washington, have recently submitted a report to the Legislature rehearsing conditions which have more or less engaged the attention of the Health Department of New York ever since its organization in 1866, and with which the readers of THE SANITARIAN generally are familiar.

There are doubtless some young people in New York who are startled by the apparently extensive researches of the committee and its developments during the past year, based upon the census statistics of 1890, but there are a good many other people old enough to know that this report, like many previous reports on the same subject, is based upon chronic conditions with which the Health Department has been all along familiar, and for the amelioration of which the department has several times secured the power of its recommendations—similar to those appended to the report now in question—alike deficient of an effective grasp of the evil and of the needful means to overcome it.

Nineteen years ago the writer had occasion to review the subject, and say that

"It is still a common thing in New York tenement-houses to find families of six or eight, or even more persons, all crowded into one room of dimensions too small for one fourth of the number, and with but one bed; father, mother, grown-up sons and daughters, and young children, all huddled together. Order, delicacy, decency, chastity—all overwhelmed by squalor. Pure air is impossible in such places, and that which pervades instead is a sickening devitalized narcotic—air surcharged with carbonic acid and organic exhalations. Drunk

with impunity, the fell destroyer, disease, in its most loathsome aspects, here runs riot, and moral uncleanness is its only competitor. Hand in hand they pursue their course; poverty, disease, vice, and some of the most abhorrent crimes are here born and matured.

"The motley population of the worst of these dens of death are criminals in ambush, apparently occupied with various industries, but for the most part these occupations are mere blinds; their chief means of support are prostitution and plunder.

"Lest it should be thought that these conditions are things of the past, that the tenement-houses of New York *used* to be as above described, attention is invited to the following data from the last report of the Board of Health for the year ending April 30th, 1874. By the census of 1870 the population of New York was 942,292; of this number 111,205, or 11.8 per cent, were of children under five years of age; of families there were 185,989; dwellings, 64,944, giving an average of 14.72 persons to each dwelling. The sanitary survey, which was completed at the beginning of 1870, found 113,402 families residing in 14,494 houses, of which only 11,964 front upon streets—that is, 1440 were and still are rear buildings. Within these 14,494 limited dwelling-places there are enumerated 463,392, or about one half of the total number of inhabitants, an average of 31.26 to each house, and that *half of the population of the city was residing upon an area so crowded that less than seven square yards of ground area was allotted to each tenement-house occupied.*

"The death-rate in the city of New York has for several years ranged from 27 to 33 per 1000 inhabitants. The mean ratio for 1867, 1868, and 1869 was 29. The total number of deaths for the year ending April 30th, 1874, was 29,084—29 84 per 1000 on an estimated population of 1,000,000.

"The whole number of tenement-houses in New York in which deaths occurred in 1873 (in houses containing four or more families) was 8856; the number of deaths in these was 14,109—64.86 per cent of the total mortality." (SANITARIAN, Vol. IV., p. 403.)

In 1879 the subject seemed to have reached a climax. In April of that year a mass-meeting was held at the Cooper

Institute attended by many of the most prominent citizens, engineered, as it subsequently appeared, by an enterprising publisher in the interest of his publication. Speeches were made by the Rev. Drs. Bellows, John Hall, and Henry C. Potter; Joseph Choate, Jackson S. Schultz, and others. Colonel George E. Waring, of Newport, R. I., the recently appointed Street Commissioner of New York, said:

He had come to New York, and learned that the last great problem of the day was to solve a question as to how a hundred human beings could live virtuous and happy lives on a twenty-five-foot lot. Never before had he seen such nasty streets as those between Madison Avenue and Murray Hill. Never before had he smelled—or hardly ever—such stinks as assailed him there. "Go and smell for yourselves, and then consider what chance you have of getting such people to help you cleanse anything—above all, to cleanse houses where their poorer neighbors live." Like a man who lived in a glass house, he came to help them to throw stones. The fact must be recognized, he said, that tenement-houses cost a great deal of money, and that no reform could be effected which did not provide for the profitable investment of that money. It was necessary to turn tenement-house capital into a new channel. Something might be done by law in strengthening the hands of the Board of Health. One great fault with the present system was defective plumbing and draining.

Professor Chandler spoke of the progress of New York in increasing healthfulness during the preceding dozen years, notwithstanding the tenement-houses. He contended that New York was not an unhealthy city; that the death-rates of other cities were not complete, while those of New York included emigrants who die on their passage West, and persons who die in charitable and penal institutions. At the conclusion of his remarks the lights were turned out, and he proceeded to exhibit stereopticon views of many of the plans that had been offered at a recent competition for "Model Tenement-Houses on City Lots, 25 by 100 Feet." He explained their good points and their defects, making it fully evident that the so-called "practical measures of reform," the much-advertised "model houses for workingmen," were for the most part ingenious devices for continuing the smothering of innocents; and especially those models which had been selected as the best—those for which prizes had been awarded.

The particular merit of these was that they provided for the largest number of tenants in the least space, and were proportionally the most beneficial to the landlords and the most oppressive to the tenants.

The plans of architects who refused to so prostitute their calling as to exhibit plans which provided for more than four families to a floor were thrown out.

In conjunction with an abstract of the proceedings of the meeting, the writer took occasion to remark upon the subject, that

"The only improvement of the tenement-house system as it then obtained in New York, and which the new plans submitted were calculated to perpetuate, was absolute destruction and prohibition. . . .

"That public economy and public health alike demand that many of such houses and lots should have their valuation assessed and possessed by right of public domain, the buildings removed, and the ground turfed over for air space. A law requiring the Board of Health to designate, say, twelve of the worst tenement-houses in the city annually for ten years to come for assessments and possession by right of public domain, would not only be a potent means of tenement-house improvement, but would save the city in the costs of pauperism, vice and crime, now due to the tolerance of such sturctures, many times the amount of the assessment. And in view of the present accessibility of cheap building lots in the vicinity, by means of the now accomplished rapid transit, by railways and ferries, in almost all directions, it is unreasonable to suppose that persons accustomed to investments in tenement-houses, who might by this means be deprived of their privileges in these overcrowded districts, would not still follow their bent under restricted conditions." (SANITARIAN, Vol. VII., pp. 177–81.)

Now, after nineteen years' continued supervision of the New York tenement-houses by the Board of Health, which, it is safe to say, is the strongest department of the city government, we have the following parallel of the conditions as they obtained twenty years ago, abstracted from the report of the latest committee just submitted to the Legislature :

"Sanitary District A of the Eleventh Ward contained June 1st, 1894, as many as 986.4 persons to every one of its thirty-two acres. The census of 1890 gives 800.47 to this district. It may be that these figures are equalled in some parts of the

world, but the only information at hand indicates but one district approaching this—a part of Bombay, which had in 1881 a population of 759.66 to the acre in an area of 46.06 acres. It should be noted that the Asiatic density is comparatively more oppressive, as it is spread over much less floor space, the New York buildings having more stories. The densest small section of Europe seems to be the Josefstadt, of Prague, with its 485.4 to the acre, but New York's Tenth Ward exceeds this with not less than 626.26 to the acre, and the Tenth Ward has nearly five times the acreage of the crowded district in Prague."

It appears, further, that the population of New York City living in tenement-houses (exclusive of the better class of such houses, called "apartment houses") is eight fifteenths, or a little more than one half of the total population. On the conditions incident upon such manner of living, the report proceeds:

"The personal observation of the committee and the testimony of numerous witnesses show that the overcrowding of the population, both as to house and district, has evil effects of various kinds; keeping children up and out of doors until midnight in the warm weather because the rooms are almost unendurable; making cleanliness of house and street difficult; filling the air with unwholesome emanations and foul odors of every kind; producing a condition of nervous tension; interfering with the separateness and sacredness of home life; leading to the promiscuous mixing of all ages and sexes in a single room—thus breaking down the barriers of modesty and conducing to the corruption of the young, and occasionally to revolting crimes.

"To illustrate this condition, take the block bounded by Essex, Hester, Norfolk, and Division streets as an example. It has a total area of about an acre and a quarter (1.25), an acre and seven hundredths (1.07) of which is solidly covered with buildings, or, in other words, in this block little more than one fifth of an acre is left for the entire breathing space of more than half its population."

The committee's views are summarized as follows:

"In this brief analysis it is found that the following factors appear, in different degrees, to influence the death-rate in different parts of the city—namely, the density of the population, the race or nationality of the inhabitants, the character of the subsoil and the facilities for drainage, the age and

method of construction of the houses, and the crowding or isolation of the houses themselves. Of these factors, when we are considering the methods of reducing the death-rate—that is, of improving the sanitary condition of the community—race and nationality must be left out of the account. These we cannot alter. Provision for drainage, both of subsoil and of the house, is made by existing legislation. Density of the population can be partially remedied by the enforcement of the present laws against overcrowding, by additional park spaces, and by increased means of intercommunication throughout the city's territory. The future tenement-house can be improved by legislation as to sanitary conditions and safety from fire."

Among the specific recommendations made by the committee are these:

"That power be given the Board of Health to destroy unsanitary buildings; that the construction of tenement-houses be improved so as to afford more light and air and better immunity to inhabitants from fire; that the ceilings of all basements occupied as human habitations be at least two feet above the level of the ground adjoining; that no wall paper be used, and all old papers removed; that halls be lighted; that overcrowding be prevented; that owners be required to file their names, so as to make the enforcement of such laws easy; that small parks be built, rapid transit pushed forward, municipal places for bathing be established, prostitution be punished with greater severity, and that the present Tenement-House Board, consisting of certain city officials, be abrogated, and special commissions, with full powers of examination and recommendation, be constituted by the Legislature at intervals of not more than five years."

THE NEW HEALTH OFFICER OF THE PORT OF NEW YORK.

DR. ALVAH H. DOTY, for several years Chief of the Bureau of Contagious Diseases, and for a dozen years or more a sanitary inspector of the Health Department of New York, was nominated by Governor Morton January 2d, and promptly confirmed by the Senate, to be Health Officer of the Port of New York, to succeed Dr. William T. Jenkins, who has filled the office with honor to himself and with great benefit to the public, under unusually trying conditions, during the last three years.

It is eminently creditable to Governor Morton that in

selecting a successor to Dr. Jenkins from the several aspirants for the office, he has chosen one according to the letter of the law—"practically familiar with quarantinable diseases"—sustained by an eminently creditable record as a practical sanitarian.

Personally, *at the outset*, Dr. Doty is the most thoroughly accomplished sanitary officer that has ever been chosen to fill the office to which he has been appointed; and he has the additional advantage of finding the quarantine establishment better equipped than it has ever before been. He has the cordial support of the medical profession and the confidence of the public. That he will justify all that is expected of him is not doubted by any one who knows him.

THE NEW STREET-CLEANING COMMISSIONER.

The appointment of COLONEL GEORGE E. WARING, of Newport, R. I., to the office of Street-Cleaning Commissioner of New York, is no less complimentary to Mayor Strong than the appointment of Dr. Doty, Health Officer of the Port, to Governor Morton.

Colonel Waring is well known to be one of the most distinguished sanitary engineers in the country; yet he has by no means limited the scope of his knowledge to the extension of the "Waring Sewerage System," in such high repute at Memphis and other cities where he has introduced it. The scope of his observations abroad, as well as at home, has been such as to pre-eminently fit him for the important duties of the office to which he has been appointed. That he will adopt more effective measures for cleaning and *keeping clean* the streets of the city than have ever been used heretofore is the just expectation of all who have knowledge of his accomplishments in this regard, and the public is to be heartily congratulated on the benefit of his service in prospect.

No reader who would be well informed on civic cleanliness should fail to read the article on the "Economical and Efficient Disposal of Garbage," on other pages of this number.

THE SCANDAL ON THE OYSTER.

THE discovery at the Wesleyan University, three months ago, that a number of students who had eaten oysters raw,

that had been taken from water polluted with sewage, and several more or less similar discoveries at other places since, have seemingly given color to the too common error that the oyster is a scavenger—an error sustained by some persons, at least, who ought to know better. For example, about a year ago we clipped from one of the foremost of our "sanitary" exchanges the following (under the head of "Answers to Correspondents"), with the purpose of correcting it:

THE OYSTER.—J. C. F., Ohio, inquires: "1. On what kind of food does the oyster subsist? 2. What are its nourishing qualities in comparison with beef and mutton?"

Ans.—1. Decomposing matter of various sorts found in the ooze at the bottom of the sea near the shore.

2. The nutritive value of the oyster is very small, and in no way comparable with that of beef and mutton.

On the contrary, the oyster is a very cleanly animal, never found in filthy water of its own accord; and its food consists of animalcules and minute vegetable organisms, *taken alive*, brought to it in the water when the shells are open, by a continual current directed toward the mouth by the action of the gills. The mouth of the oyster (like other *lamellibranchiata*, it has no head) is situated in a *cul-de-sac* beneath a hood formed by the union of the two edges of the mantle posteriorly. The mantle is the first fringe of the oyster observed on separating the shells, and the gills are seen in four rows a little within the fringed edge of the mantle. The luscious, film-covered pulp, which, when the oyster is in good condition, constitutes about three quarters of its whole bulk, is the *liver*, not, as persons who are ignorant of the anatomy of the oyster think, the maw, for it has no maw. The mouth is the chief part of the digestive apparatus, the remaining portion, except the liver, being very small, but like the mouth in its function, a mere absorptive surface, and never containing any impurities.

The oyster is, indeed, among the lowest and simplest of the class of animal organisms to which it belongs, and its food is of such a nature as to admit of easy absorption into its substance, while it has the power of rejecting what is not suited to its nourishment—as all such organisms have.

To its wholesomeness testimony is universal and from an-

cient times. The praise which Pliny bestowed on the oyster, calling it the palm of glory of the table, is still re-echoed by thousands of enthusiastic admirers all over the civilized world. It would be an easy matter to show that the oyster reaches its highest degree of excellence naturally in thoroughly clean waters; as also when it is transplanted and cultivated artificially. Our present purpose is to show that the bad qualities attributed to it by the recent discoveries are wholly attributable to the carelessness or ignorance of those who cultivate it.

With regard to its alleged deficiency in nutritive value, as compared with foods less easily digested, it should be borne in mind that it is not by the proportion of nutritive material that any food substance contains that its nutritive value is to be measured, but by the ease with which it is transposed into the blood and tissues of our bodies. Thus measured, the oyster is unrivalled.

SANITARY CLIMATOLOGY.

U. S. DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU,
WASHINGTON, D. C., January 2, 1895.

THE interest manifested by every class of people in the subject of climate and its influence on health and disease has determined the Honorable the Secretary of Agriculture, through the medium of the Weather Bureau, to undertake the systematic investigation of the subject.

It is hoped to make the proposed investigation of interest and value to all, but especially to the medical and sanitary professions, and to the large number of persons who seek, by visitation of health resorts and change of climate, either to restore health or prolong lives incurably affected or to ward off threatened disease.

The study of the climates of the country in connection with the indigenous diseases should be of material service to every community, in showing to what degree local climatic peculiarities may favor or combat the development of the different diseases, and by suggesting, in many instances, supplementary sanitary precautions; also by indicating to what parts of the country invalids and health-seekers may be sent to find

climatic surroundings best adapted to the alleviation or cure of their particular cases.

The hearty co-operation of the various boards of health, public sanitary authorities, sanitary associations and societies, and of physicians who may feel an interest in the work, is asked to achieve and perfect the aims of this investigation.

No compensation can be offered for this co-operation other than to send, free of cost, the publications of the Bureau bearing upon climatology and its relation to health and disease to all those who assist in the work.

Co-operation will consist in sending to this office reports of vital statistics from the various localities. That these reports may be of value, it is evident to all that they should be accurate and complete, and be rendered promptly and regularly. Blank forms of reports have been prepared so as to occasion as little trouble and labor as possible on the part of the reporter, and will be furnished by the Bureau on application.

At the very beginning of the investigation it is not possible to outline precisely the channels through which the results obtained will be made public, but it is hoped to publish soon a periodical devoted to climatology and its relations to health and disease. The publication will probably resemble in size and general appearance the present *Monthly Weather Review*, the subject-matter being, of course, different.

More detailed information will be furnished on application.

MARK W. HARRINGTON,
Chief of Bureau.

MAL DE MER.—A correspondent sends the following story, for the truth of which he vouches, concerning a man and woman who were horribly seasick crossing the English Channel. The stewardess found them sitting together on the deck, the woman leaning back with closed eyes, and the man's head resting on her shoulder. "Your husband seems to feel even worse than you do," said the stewardess, sympathetically. The sick woman opened her eyes and glanced at her fellow-sufferer with a sort of despairing indifference. Then she gasped as she closed her eyes wearily again, "He's not my husband; I'm sure I don't know who he is."

NEW BOOKS AND BOOK REVIEWS.

ANY BOOK reviewed or advertised in THE SANITARIAN costing $1.50 or less will be sent *free* to any present subscriber sending the name of a new subscriber, or to any new subscriber on receipt of the full subscription price sent on his own account; or any book so reviewed or advertised costing more than $1.50 will be sent at a discount of that amount.

POPULAR SCIENTIFIC LECTURES. By ERNST MACH, Professor of Physics in the German University of Prague. Translated by Thomas J. McCormack. Cloth, gilt top. Exhaustively indexed. Pp. 313. Price, $1. Chicago: The Open Court Publishing Company.

In this collection of lectures are garnered the intellectual fruits of one of the foremost scientific careers of Europe. Titles of the lectures are: 1. The Forms of Liquids; 2. The Fibres of Corti; 3. On the Causes of Harmony; 4. On the Velocity of Light; 5. Why has Man Two Eyes? 6. On Symmetry; 7. On the Fundamental Concepts of Static Electricity; 8. On the Principle of the Conservation of Energy; 9. On the Economical Nature of Physical Inquiry; 10. On Transformation and Adaptation in Scientific Thought; 11. On the Principle of Comparison in Physics; 12. On the Relative Educational Value of the Classics and the Mathematico-Physical Sciences. Apart from the copious positive matter of these lectures, they are singularly entertaining by the beauty of style in which they are written, and by the choice of simple and attractive subjects.

Only the first seven and the tenth lectures may, with strict propriety, be termed popular. The rest are more philosophical in character and deal with the *methods* and *nature* of scientific inquiry. That on "The Conservation of Energy" is a re-elaboration with omissions and additions of an early tract which has won a high and enviable place in the history of scientific criticism. That "On the Economical Nature of Physical Inquiry" is the famous memorial address delivered at the festival meeting of the Vienna Academy of Sciences in May, 1882; that on "Comparison in Physics" was the principal

address made at the last German *Naturforscherversammlung* in 1894. It is in these branches that the author has done his most original work and won his world-wide reputation.

THE ORIGIN OF LANGUAGE AND THE LOGOS THEORY. By LUDWIG NOIRÉ. "The Religion of Science Library." Price, 15 cents. Chicago: The Open Court Publishing Company.

This is a brochure of fifty-seven pages, and begins with a quotation from Geiger, that "the evolution of variety from unity seems to be the great fundamental law of all development of nature and of mind. This law, in language also, leads us back to a very insignificant germ, to a primitive sound, which expressed the sole and infinitely limited subject-matter that man first took notice of or beheld with interest, and out of which the whole wealth of language—nay, I am unhesitatingly convinced of all languages—through untold millenniums has been slowly unfolded." This is the germ of the book, elaborated and supported by quotations from other writers, and by comparison of the elements of human language with that of apes and other animals.

HERNIA: Palliative and Radical Treatment in Adults, Children, and Infants. By THOMAS H. MANLEY, A.M., M.D., Visiting Surgeon to Harlem Hospital, Consulting Surgeon to Fordham Hospital, Member of the New York Academy of Medicine, American Medical Association, New York State and County Medical Associations, International Medical Congress, Pathological Society, National Association of Railway Surgeons, etc. 8vo, pp. 231. Illustrated. Philadelphia: The Medical Press Company, Limited.

A work of much practical value to surgeons, comprising all the important advances made during recent years in the diagnosis, pathology, management, and surgical treatment of hernia in all its aspects. Appended is a very complete bibliography of hernia, of practical utility to all who would pursue the subject.

SEXUAL NEURASTHENIA (NERVOUS EXHAUSTION), ITS HYGIENE, CAUSES, SYMPTOMS AND TREATMENT, WITH A

CHAPTER ON DIET FOR THE NERVOUS. By GEORGE M. BEARD, A.M., M.D., formerly Lecturer on Nervous Diseases in the University of the City of New York, Fellow of the New York Academy of Medicine, Member of the New York and Kings County Medical Societies, of the American Medical Association, etc. Edited, with notes and additions, by A. D. ROCKWELL, A.M., M.D., formerly Professor of Electro-Therapeutics in the New York Post-Graduate Medical School and Hospital, Fellow of the New York Academy of Medicine, Member of the New York Neurological Society, etc. FOURTH EDITION, WITH FORMULAS. 12mo, pp. 294. Price, $2.75. New York: E. B. Treat.

The succeeding editions of this work have probably done more to popularize the subject of which it treats than all other publications combined. And this *fourth* edition, edited by Dr. Beard's former associate, Dr. Rockwell, thoroughly familiar with Dr. Beard's views, and who has diligently pursued the same line of study, more completely comprehends all the recent advances made in the investigation and successful treatment of the morbid conditions traceable to sexual perversity than any other work. It is gotten up in the excellent style common to the publisher, and is alike commendable to medical students and practitioners.

TRANSACTIONS OF THE CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS, 1894. Vol. III., pp. 396. Illustrated. W. H. Carmalt, M.D., Secretary, New Haven, Conn.

The papers and discussions of the volume are of unusual interest and timeliness, comprising such subjects as Morphology as a Factor in the Study of Disease, by Professor Harrison Allen, Professor Frank Baker, and others; Chemicals, Physical and Bacteriological Studies upon Air over Decomposing Substances, with Special Reference to their Application to the Air of Sewers, by Dr. A. C. Abbott, Professors Abraham Jacobi, Beverly Robinson, Victor C. Vaughan, and William H. Welch; Leprosy, its Distribution, Treatment, and Control, by Professors J. Nevins Hyde, James E. Graham, Prince A. Morrow, Surgeon-General Walter Wyman, and others; Bacteriology of Pyelonephritis, by Surgeon-General George M. Sternberg, and its discussion; Nephritis in its Surgical

Aspects, by Dr. E. L. Keyes; Conservative Surgery and Treatment of the Female Pelvic Organs, by Professors William M. Polk, William Goodell, and others; and half a dozen other important papers and addresses by distinguished authors, among them the Address of the President, Professor Alfred L. Loomis, on The Influence of Animal Experimentation on Medical Science, with which the volume closes. This defence of the means by which the science of medicine has in all times made its most important advances is a fitting memorial of the distinguished author, whose death is announced on the day of this writing, January 23d, 1895.

CONTEMPORARY LITERATURE.

ANTITOXINE.—Apropos of the current discussion of antitoxine, the alleged diphtheria remedy, and its merits, the editor of the *Review of Reviews*, in "Progress of the World," January number, calls attention to the decline of such old-fashioned maladies as small-pox and typhoid-fever and the increased efforts of modern sanitary science to grapple with children's diseases, especially diphtheria and scarlet-fever. The *Review* also offers a few suggestions concerning the duty of society in relation to the condition of city slums, and the housing of the poor. To show that the situation in New York is not quite as bad as it has been represented, the editor cites the suggestive fact that the mortality rate for New York tenement-houses is lower than that for the slum districts of European cities. There is ground for encouragement in this.

Whatever then should prove to be the merits of this alleged cure for diphtheria, there can be no mistake in the policy of public cleanliness and of constantly improved health administration. Our American cities come short of their European contemporaries in most points of municipal organization and service. Fortunately, in the matter of public health work we have less to be ashamed of than in almost any other particular. There have been some scandals in the Health of Department of New York City, but there has been very much to commend. All that is needed to bring our American municipal health administration up to a point of scientific and prac-

tical efficieney equal to that of the very best managed foreign cities, is a reform of our municipal government in general respects. The work of health boards is necessarily hampered at many points by the existence of corruption, of spoils methods, and of ignorance and inefficiency, in other departments of city government.

RELAPSE AND IMMUNITY AFTER DIPHTHERIA ANTITOXINE.—The fact that Behring himself has recently increased the immunizing dose of antitoxine, and shortened the estimated period of immunity, shows that our knowledge of immunity in diphtheria is still very rudimentary. If the period of immunity depends upon the strength of the injection, it will certainly vary, for it seems hardly possible that even with the greatest care, an antitoxine serum of absolutely constant strength can be produced. The normal unit of strength is calculated on the basis of the amount required to protect a guinea-pig against a dose of toxine which proves fatal in other guinea-pigs. We have here a large element for variation in the varying resistance to the toxines of the animals employed, which can hardly be supposed to be constant. Other examples of an almost unavoidable uncertainty as to the strength of the toxines employed and antitoxines produced might be multiplied.

Practically there has been found to be a variation in the strength of the antitoxine produced by the British Institute of Preventive Medicine. Drs. Washburn, Goodall, and Card, in the series of cases before referred to, found that, immediately on beginning treatment with a new consignment of serum, a more rapid effect was noted, and a smaller dose was required to produce a given result. On investigation it was found that this consignment was the first product from a fresh horse not previously employed. Roux has noted marked variation in the strength of the serum produced at the Pasteur Institute, and has in one case been obliged to administer doses amounting to a total of nearly seven ounces.

It would seem, in the light of these experiences, that there might be some slight variation in the "*antitoxin-normal-einheiten*", produced under Behring's own direction.

Whether or not the period of immunity depends upon the

strength of the injections, it will probably vary with unknown peculiarities of the patient, and be a very variable quantity, capable of approximation only within wide limits.—*Boston Medical and Surgical Journal, January 17th*, 1895.

WHAT ONE WOMAN SAYS.—It is curious and interesting at any summer resort or other gathering of intelligent women to see the general profound indifference to politics—to any news of the day, however exciting, which relates to the affairs of the nation. Still more curious is it to observe, on questioning ardent female suffragists, how little they know about the great questions of the hour. They generally say, "Oh, both parties are terribly corrupt, but when women vote politics will be purified." Will it? Are not women also possessed of moral infirmities? Will not many women sell their votes, bargain for office, intrigue, combine with others for selfish ends? Where there is no temptation, there is no sin; but when power comes, and with it temptation, shall we find that God has created one sex "good," the other "bad"? Ah no! women are like men, of the same time and race, only their pursuits, occupations, and habits of life differ; their sphere is domestic, their intercourse with the world far more limited. They now have power to do far more by influence in public matters, by an intelligent interest in schools, hospitals, almshouses, than they exercise, and it is lamentable that so few women care how the public charities of their own towns are managed. There is no good reason to think that the right of suffrage will increase that interest. A spirit of humane unselfishness leads men and women both to care for the unfortunate—and too few men care for them now, in spite of their right to vote.—*Clara Temple Leonard, in the Century for January.*

VICTIMS OF WILD ANIMALS IN INDIA.—Ferocious as the rogue elephant appears to be, its record as a man-killer is far below that of other animals in India. Thus in India, in 1875, the tigers killed 828 persons and 12,423 domestic animals; wolves killed 1061 persons; leopards, 187 persons and 16,157 domestic animals; while the elephant is charged with but 61 persons killed, and 6 domestic animals. Rogue tigers, wolves,

and leopards are far more to be dreaded than rogue elephants. —*C. F. Holder, in St. Nicholas for January.*

WHAT TO DO FOR EXERCISE.—Let us say, then, that it is winter. You are at work in a factory or in a store or on a farm or in school from seven, or eight, or nine, till from four to six at night. Many people will tell you to get a football and hang it from the ceiling. Then stand off and punch it. Another will say, "Go through a lot of fancy movements on getting out of bed in the morning." These things are all very well, but there are some things that are much better than that. For example, if you have a garret, or, better, if you have a barn near by that you can use, rig up a set of high-jumping poles out of two clothes poles, and a light cross-bar. Every night before supper, just after coming home, go out in the barn, and by lamp-light make thirty good jumps at as high a point as you can go. It is of course better to go in the morning, but we all hate to get up early. If there are two boys in the family, or if you have any boy friend who lives near by, make him punt with you. That will add to the game.

This is, however, only an example. Another is that you buy a double pair of boxing-gloves, and begin to spar with the same friend one or two evenings a week. I have seen such a plan started by two boys, one of whom still has a fond remembrance of the evenings spent in learning this fine sport. The meeting that was to have been once a week gradually grew in importance, until finally a club was formed. Championships and such like things came in time, but at first we began by clubbing together and buying a book on boxing, and then we tried to know all we could about boxing, tried to keep our temper, and tried to judge as skilfully as possible. In time a tournament came, and then a series of tournaments, and before we knew it our two evenings a week had given us admirable exercise, a good kind and vigorous condition of muscles, one or two black eyes, and general healthy and hearty feeling, which never could have been attained from any amount of pulley-weights. Besides the fact that we had had a glorious time, we seven or eight boys during the winter. —*Harper's Young People.*

SCHOOL-ROOM VENTILATION AS AN INVESTMENT.—Public indifference to hygienic requirements was significantly illustrated lately in a busy manufacturing settlement in the State of Massachusetts. The city of L—— had erected and equipped a costly high-school edifice with a corps of highly paid instructors, to initiate in the more advanced branches of scholarship at the public charge pupils of whom only a minority could hope to utilize these expensive accomplishments in every-day life. All seems to have been regarded with complacency until the charge for an unusually complete ventilating apparatus was encountered. One would have thought that all pupils, whether or not able to solve a problem in differential calculus or to construe a line of Virgil, would have excellent use for their own bodies; but neither this consideration nor the almost infinitesimal magnitude of this particular outlay—an outlay which, including current expenses and interest on capital, was about half a cent per occupant daily, in comparison with the strictly scholastic expenses—sufficed to reconcile the objectors to such unheard-of extravagance! Poverty of valid arguments was compensated by strength of epithets, and such expressions as "cranky" and "visionary" were freely applied to those who had thought it improper that rooms packed with adolescent humanity and seldom, alas! quite free from victims of contagious diseases, should be unprovided with at least a sufficiency of breathing air. The incident showed that even in cultured New England there was a minority—fortunately, a minority only—not yet emancipated from the mediæval fantasy which contemned nature, and which regarded the soul and the body as hostile entities, both indeed corrupt, but the latter only hopelessly so, and fit only to be "mortified" and suppressed. A strange infatuation, surely, to have held its ground for nineteen centuries, in face of the lesson left by the matchless educators of Hellas in the harmonious development of every faculty and every sense!—*George H. Knight, in The Popular Science Monthly for January.*

MEN AND WOMEN IN NEW YORK.—The census reveals some curious facts about the distribution of New York's excess of women. New York City has 20,000 of them; Brooklyn, 17,000; Albany, 5500; Troy, 5000; Utica, 3000; Roches-

ter, 4000; Syracuse, 1100. They are all, practically, in the larger cities of the State, the one exception being Buffalo, which has 4000 more men than women. It would be interesting to know more about these 4000 superfluous Buffalo men, whether they are Polacks, Italians, lake sailors, canal-boatmen, or merely lively young bachelors from the country in the western part of the State who have gone to Buffalo to seek their fortunes. New York City's business opportunities, which attract crowds of men, seem to attract quite as many women. Yet the excess of women in New York is comparatively small. The city has 45 women to every 44 men, while Brooklyn has 26 women to every 25 men, and Troy 11 women to every 10 men. Why should it happen that in the suburban counties nearest New York there should be more men than women? It would seem that of the population drawn by the metropolis to this end of the State the unmarried men would nearly all live in the cities, and the dwellers in the suburbs would for the most part be people with families. Yet the suburban counties all show an excess of men—1300 in Westchester, 1700 in Richmond, and 2300 in Queens.—*Harper's Weekly.*

CHARLESTON'S OUTER ASPECT.—First, it is very beautiful; next, it is dignified and proud; third, it is the cleanest city (or was when I was there) that I have yet seen in America; and, last of all, it is a creation by itself—a city unlike any other that I know of. It is built on a spit of land with water on three sides, like New York, and this gives its people that constant and enduring delight which continual views of moving water never fail to provide. Part of its early history is that of a planters' summer resort, and something of that forgotten holiday air still clings to it. If it suggests any city that I have ever seen, it is New Orleans—perhaps because of an indefinable Latin trace that is seen in the stuccoed houses and walled gardens, and again, because of the important part the gardens play there, and the profusion of flowers that results from them.—*From "Charleston and the Carolinas," by Julian Ralph, in Harper's Magazine for January.*

THE *Home Journal* is the exponent of that literary and art

culture which gives grace and refinement to social intercourse —a society journal in the best sense of the term. Out-of-town readers will find the best life of the metropolis reflected in its pages. It is an international journal, and by its foreign correspondence and essays brings its readers *en rapport* with the social life of the great European centres. The *Home Journal* addresses its editorial and advertising columns to people of culture and fashion. It is essentially a paper for the home, a home journal, and the only *Home Journal.* $2 a year. Morris Phillips & Co., New York.

SANITARY PATENTS OF RECENT DATE.

531,329. Disinfecting apparatus. R. P. Pictet, Paris, France. A cylindrical vessel with a door in one end arranged to resist atmospheric pressure, an air-pump or exhauster connected with said vessel for creating a vacuum, and to permit of antiseptics being introduced therein to react on articles or bodies to be disinfected in said vessel, means for actuating said pump or exhauster, a gasometer having an oil seal, pipes having stop-cocks connecting said vessel with said gasometer, and pump and outlet-pipe from said pump having a stop-cock.

531,476. Inhaler. E. Souchon, New Orleans, La. A receptacle for containing the absorbent material, pipes leading from said receptacle, and an air-bulb connecting with said pipes and attached to said receptacle.

531,889. Preparing germ matter for medicinal use. J. R. Witzel, Philadelphia. Consists in first placing the said substance in vacuo, and then subjecting it when in the same to a number of succussions.

532,306. Surgical needle-holer. L. R. Brown, Elizabeth, N. J. A clamp for the needle, with a rotary nut having a cam to control the clamp, the said nut within the control of the thumb and forefinger of the hand grasping the needle-holder.

532,666. Surgical instrument. E. E. Johnson, Denison, Tex. A tube provided with guides therein and holes, a frame consisting of two essentially parallel members, adapted to enter said tube and move between said guides, and lugs provided on each of said members and adapted to cover or uncover said holes, as may be desired.

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SANITARY BRUSHWOOD PICKED UP IN EUROPE.

By C. W. CHANCELLOR, M.D., United States Consul at Havre, France.

ALL Europe is now held in the grip of King Frost, and the meteorological situation is interesting from a sanitary point of view. Notwithstanding the severe weather the health statistics are reassuring at present. The mortality is not above normal, the keen air having the effect of checking the deadly operation of the murderous microbe. Dangerous maladies are thus warded off; but, on the other hand, the excessive cold makes occasional ravages among the poor and feeble. The working classes, who inhabit badly heated dwellings, suffer a good deal, and it is not surprising that there is a general demand for the construction of houses which shall have hot-air stoves or furnaces similar to those used in the United States, capable of circulating warmth throughout the whole length and breadth of the building. Europe is behind the United States in house-warming arrangements, nor is it free from the jerry-builder, who piles up his edifices anyhow, and cares not a jot if future tenants be frozen in winter, parboiled in summer, and finally buried in a mass of ruins.

As matters stand at present, the occupant of a flat or house with modest means finds his warmest welcome not in his own exiguous residence, but in the large, well-lighted, and well-warmed *cafés* or *assommoirs*, as Zola names the low drinking-saloons of Paris. The diminutive and uncomfortable home of the laborer is often a mockery, and his small fireside a sham, so that it is not to be marvelled at if he spends the most of his time during these excessively frosty evenings in the garish establishments, where cheap absinthe and alcohol

are supplied, and where an agreeable warmth is ubiquitously diffused. As a rule, a dirty man will be a dissolute man, and as a positive axiom a man surrounded by discomforts at home will seek attractions outside, too often in low brothels and drink-houses, where health and life are generally sacrificed.

THIRST FOR AMUSEMENTS.

The desire for more amusement, more variety, more color in life, which has made itself so keenly felt among the well-to-do, has penetrated to the hovel of the poor, whose occupants are no longer content with

> "The dull mechanic pacing to and fro,
> The set gray life and apathetic woe."

The poor require some share, even if it be, as from the nature of the case it must be, a slender share in the gayeties by which their more fortunately placed neighbors are enabled to relieve the strain upon their nervous systems, and to sweeten the bitterness of daily toil. It is not only a humane, but, from an economical and sanitary point of view, a wise policy to supply amusements to the poor. Obviously, however, it is only by the kindly and public-spirited efforts of their richer neighbors that they can be supplied ; and charitably disposed persons in England have taken the matter in hand, and in some of the towns provided comfortable resorts and cheap amusements for this class, such as a series of *tableaux vivants*, prefaced by felicitous recitations of such familiar legends as "Little Miss Muffet," the "Old Woman who Lived in the Shoe," etc. Such entertainments would not only be productive of much happiness, but would tend to promote morality and the public health. There is, perhaps, no way in which the sanitarian, who is *ipso facto* a humanitarian, could employ his influence to greater advantage than in impressing upon the public the duty of ministering to that need of recreation and amusement which is so acutely felt among the humbler classes of our fellow-citizens, and which would tend to improve both their moral and physical condition. There are many indications of an awakened interest in this subject on the Continent as well as in England.

OYSTERS AS CONVEYERS OF DISEASE.

It is a matter of no small satisfaction to see certain diseases gradually diminishing in frequency, as the hygienic condition and water supply of large towns improve. This has been the case particularly in Berlin, Munich, and Vienna, while, more recently, the introduction of an adequate supply of spring-water into Paris, together with the admirable system of municipal disinfection practised in that city, has reduced the death and sick-rates from typhoid-fever in a most surprising manner. But now come the reports, as if in echo of similar occurrences in the United States, that the oyster is under suspicion of being responsible, for some, at any rate, of the numerous cases of enteric-fever which have recently occurred among the more wealthy classes of Londoners and other English towns, and also at Havre, France, where the disease prevailed as an epidemic last fall, and still exists in a sporadic form. Of course when no apparent defect exists in the water supply nor in the drainage of a typhoid-stricken house, and when the milk supply is also found to be unimpeachable, some other source of infection must be looked for. In the towns above referred to the plague has been ascribed to the consumption of tainted oysters, or rather oysters taken from contaminated waters—near the outlet of city sewers, for example. Cases have been reported in which only oyster eaters among the members of a family have been attacked. A young man recovering from influenza, who had been supplied with oysters in order to restore his strength, was stricken with the fever; and so, too, were a couple of persons who had regaled themselves simultaneously with an oyster supper a fortnight before. A barrel of oysters was sent to a country house, and two people partook of the contents; both were attacked at the same time, and they were the only sufferers. All this has been construed against the oyster, and but little account taken of the befoulment of the water where it is cultivated. Unfortunately we are left in doubt as to the extent to which the sewage-poison of oyster beds has been carried. The indictment has been drawn against the oyster through ignorance of its nature, while the real fault is the needful protection of the planting grounds. In no case should the con-

tents of sewers or drains be allowed to flow over the beds or into the breeding places of oysters.

COLD WATER TREATMENT IN TYPHOID-FEVER.

Considering the high price of oysters in Europe, it is not necessary that the ordinary citizen should indulge in such a luxury when it threatens him with a calamity like typhoid-fever; but if he persists in taking the risk, he may at least be saved from panic by remembering that under the somewhat modern treatment of the disease by cold water, applied inwardly and outwardly, a very small percentage of cases die. This treatment is founded upon the theory that the patient is poisoned by the retention in the system of products secreted by his own cells, as well as by the specific microbe which has invaded his body, and which ought to be eliminated by the kidneys, but are not under ordinary circumstances. It has been found that by bathing a patient day and night, in water at a temperature of 68° or 70° Fahr., at regular intervals of three or four hours, for ten or fifteen minutes, the kidneys can be made to secrete in a most remarkable manner, and the liquid thus secreted and passed carries with it the poisonous products that had been accumulating and poisoning the patient. This process, in addition to reducing the temperature, is said to induce an abnormal thirst, and the patient will readily drink large quantities of water, which serves to flush all the cells and ducts as it passes on its way to the kidneys. It is said that a patient treated in this way will pass from two to five litres of water in twenty-four hours, the quantity in health for an adult being about one and a half litres. This treatment which, until recently, has been used mainly in hospital practice, where patients are generally received only at an advanced stage of the disease, shows, from statistics based on a large number of cases, only 6 per cent of deaths. In private practice, where the treatment is applied in the early stages of the disease, the result is still more remarkable, the mortality being not over 2 per cent.

A recent writer says of this treatment: "It is desirable not to allow the disease to gain any headway, to prevent accumulation of toxines and products of dissimilation. It should be applied through thick and thin, and methodically, typhoid-

fever being a complaint of the greatest treachery, in which one must be always forearmed, not knowing at what minute some sudden change may occur. For this reason the treatment must be applied even to the lightest cases, as, though light one day, they may be in a desperate condition twenty-four or forty-eight hours later. There appear to be only two counter-indications to the methodical carrying out of the water treatment—perforation of the intestine and serious internal hemorrhage."

WHY WE FAIL TO KNIT UP THE RAVELLED SLEEVE.

Dr. de Fleury, an eminent French physician, has recently published an interesting treatise on insomnia, in which the subject is treated from both a medical and sanitary standpoint. He starts out upon the basis that insomnia is caused either by an excessive depression or elevation of the circulation, resulting from certain nervous disturbances. For example, he has observed that in a healthy subject the average pressure of the circulation, measured on the radial artery, during wakefulness, is equal to 16 or 17 centimetres. Now if the pressure should be raised above 17 centimetres or depressed below 8 centimetres, an organic disturbance results, and the sleep becomes disturbed; and if the elevation or depression be still further accentuated, sleep becomes utterly impossible.

According to the observations of Dr. de Fleury, four different degrees or stages are to be considered in measuring the sanguine pressure. These degrees are fixed in a scale, the extreme limits of which range from 1 to 25 centimetres of mercury, within which the degree of blood pressure may vary.

First degree: Within a pressure of from 20 to 25 centimetres sleep is impossible; the brain is not only awake (active), but excited.

Second degree: Between 16 and 20 centimetres the blood pressure is normal for a healthy adult while awake. This tension, however, although perfectly compatible with daily activity, is abnormal for the hours of sleep. An adult in good health has a pressure of 17 centimetres during the day when awake, and 11 at night when asleep. Should the tension of 17 persist on retiring to bed, insomnia would result.

Third degree: The zone of calm, normal sleep oscillates between 9 and 12 centimetres. When there is an excess either above or below this zone, there will be disturbed sleep attended by dreams, agitation, etc.

Fourth degree: This represents a very low pressure, such as exists in anæmic subjects and in convalescents from typhoid-fever, who are really in a state of inanition. Such patients have a pressure of from 8 to 12 centimetres during the day, with a fall at night to 6, 5, or 4 centimetres. At this point the brain is excited by want of nutrition, and sleep is unattainable.

As may be seen from the foregoing, there are two clearly defined conditions of insomnia—one of depression and another of excitement. In treating the former, nerve stimulants should be used, especially caffeine. The latter condition is to be combatted by sedatives, such as the bromides. But, as Dr. de Fleury advises, it is better to avoid medicines and endeavor to bring back the nervous system, which is the great regulator of the organism, to a healthy condition by appropriate natural means. For example, physical exercise and intellectual work is recommended for patients with arterial hypertension, or whose blood pressure is too high, in order to exhaust the excess of force of their central nervous apparatus. This class of patients should never under any circumstances work in the evening or after nightfall. Their tasks should only be attempted during the morning hours. Moreover, they must observe temperance in all things—avoid alcoholic drinks, excess in eating, and highly seasoned food. The diet recommended consists of white meat, green vegetables, eggs, etc. Finally, on going to bed, the head should be elevated, and care taken to avoid excess of covering.

The reverse of the foregoing treatment should be practised by patients affected with insufficient arterial pressure. Measures capable of exercising a dynamic action on the organism should be adopted, such as massaging, stimulating douches, dry frictions, subcutaneous injections of inert liquids, electrizations, etc. All such measures will produce excellent results; but it is further necessary that the patient should be highly nourished and sleep with the head low, so as to induce by gravity an afflux of blood to the brain.

To these two systems of treatment Dr. de Fleury adds a third, which he calls "sleep-education." This consists simply in habituating the patient to regular hours for sleep, which is of much more importance than might be thought at first glance, since the most obstinate insomnia may be overcome in a short time by this measure alone. According to Dr. de Fleury, one of the best receipts for sleeplessness is, "Early to bed and early to rise."

A NEW DANGER FROM ARTIFICIAL TEETH.

A gentleman who wore artificial teeth recently suffered from pains in his tongue, which defied the diagnosing powers both of his dentist and his doctor. Finally an electrician examined the plate on which the teeth were fixed, and found that two different metals had been used to secure them, and by attaching wires to each end of the plate, and placing a galvanometer in the circuit, a "considerable current" of electricity was found to be passing. In fact, a battery had been formed in the mouth by the two metals, the moisture of the tongue acting as the necessary fluid. Immediate relief was experienced when the metals were covered with an insulating varnish.

C. W. CHANCELLOR.

HAVRE, FRANCE, January 17, 1895.

EXERCISE.

THE first Physicians by Debauch were made;
Excess began and Sloth sustains the Trade;
By Chase our long-lived Fathers earn'd their Food;
Toil strung the Nerves and purify'd the Blood;
But we their Sons, a pamper'd Race of Men,
Are dwindled down to threescore Years and ten.
Better to hunt in Fields of Health unbought,
Than fee the Doctor for a nauseous Draught.
The Wise for Cure on Exercise Depend:
God never did His Work for Man to mend.

—*Dryden.*

AMERICAN PUBLIC HEALTH ASSOCIATION.

Abstract of the Proceedings and Papers of the Twenty-second Annual Meeting, held at Montreal, Canada, September 25th–28th, 1894.—Continued from page 139.

AT THE AFTERNOON SESSION OF THE THIRD DAY'S PROCEEDINGS:

HYGIENE IN MEDICAL EDUCATION, by DR. J. J. DESBROCHES, editor of *Journal d'Hygiene Populaire,* Montreal, was read by title only. It will be published in full in our next number.

THE ADVISABILITY OF TEACHING THE RULES AND PRINCIPLES OF HYGIENE IN THE PRIMARY SCHOOLS BY MEANS OF OBJECT-LESSONS was read in Spanish by DR. JESUS E. MONJARAS, Inspector-General of Public Health, etc., San Luis Potosi, Mexico. The annexed abstract is a translation from the contribution. A novel feature was the suggestion to teach young children a collection of facts which form the bulk of hygiene, by means of toys and magic-lantern slides, so as to deprive the pupil of the unavoidable aridity and dryness of books, with the hope that a great deal more is to be attained by dint of perseverance in showing the children toy disinfecting stoves, toy sanitary water-closets of different kinds, toy models of drain pipes, etc., thereby forcing them to commit to their memory a large number of words which they cannot otherwise possibly understand. A few phrases of explanation from magic lantern slides are easily stored forever in their tender minds. A doll-house properly ventilated, provided with suitable sanitary appliances, in which the ground is shown drained with toy pipes, gives them a perfect idea of how a dwelling-house should be built according to the best principles of hygiene; better than twenty pages of hygienic printed matter. Toy manufacturers should be encouraged to devise hygienic contrivances which will be more useful in the instruction of young pupils than the usual methods employed; besides this, their utility will occupy many leisure hours of a child from infancy until they attain eight to ten years of age.

After they grow older and having learned these object-lessons, children should be given a good general knowledge of human anatomy with a view of teaching them how to prevent the human form from deformity; the composition of the air and water, with the necessity of maintaining their purity, should be demonstrated, and, above all, boys and girls should be taught the elements of sanitary architecture. Every good citizen should know how to intelligently do his share in preserving the public health.

The next paper read was on THE IMPORTANCE OF TEACHING HYGIENE IN ELEMENTARY SCHOOLS, by DR. S. GAUTHIER, Medical Officer of Health of Upton, Quebec.

"In the country where I live," he said, "and where I have passed sixteen years of my life, practising the art of medicine, I must admit that I have encountered great difficulties in putting into execution the rules of the Board of Provincial Hygiene.

"In several places, burying-grounds immediately adjoining the church, and even with charnel-houses under the latter, are to be seen. In my village, situated on the border of a river, the ground presents a well-marked declivity toward the shore; the bulk of the population naturally massed around the church, which is situated on an elevation, and the river is on the southeast, the cemetery at the back of it, the convent to the north, and the college to the west. The natural drain of all these edifices winds its course toward that part of the village where the population is more dense, thus exposing it to the pestilential emanations of the surrounding establishments.

"The infiltration of the cemetery water, which works its course through the cellars of the habitations toward the river, together with the contents of the drains of the buildings mentioned above, is a real source of infection.

"I myself was made the target of public vengeance, when I protested against the erecting of a charnel-house in the cellars of the sacristy. I must add, gentleman, that this plan was supported by the curé of the parish and approved by an able architect of the city of Montreal; happily, the authorities of the Council of Provincial Hygiene prevented the construction of such an abomination.

"Now, our citizens are to construct an aqueduct. As regards the promoters of the project itself, they undoubtedly deserve to be congratulated; but, gentlemen, I feel confident that you will be very much surprised in learning that they omitted to utilize the same excavations for the drains.

"The best way to promote this subject," he said, "is to force its special study in the elementary schools, and oblige the instructors to learn it by making it a part of the curriculum of academic studies."

THE INSPECTION OF SCHOOL CHILDREN WITH REFERENCE TO EYE-SIGHT, by DR. T. D. REED, of Montreal, was the next. It had been found, he said, that the conditions of town life generally, and the conditions of school life in towns especially, were distinctly unfavorable to the development and improvement of the faculty of vision. With the yearly advance of studies in schools and colleges the number of defective eyes increases, from which it is concluded that part of the price of education as at present carried on is damage to the delicate organs of sight. How necessary, therefore, that the benefits of the ophthalmic science should be afforded to the young as soon as education begins. The author pleaded for general introduction into schools of the simple tests recommended by the Anthropometric Committee of the British Association for the Advancement of Science. Refraction and eye-strain having been attended to, he would urge the possibility of educating the eye in rapidity and accuracy of action. The Indian and other aborigines, accustomed to exercise their vision in endeavoring to see distant game or lurking enemies, acquire a sharpness and quickness of vision much exceeding that of modern city residents. Would it not be well to test systematically the vision of school children, and stimulate the exercise of it as a matter of competition? All the special senses are improved by exercise, and many of the physical disabilities incidental to town life have been diminished by the popularity and prevalence of physical education. Prizes for accurate and extensive seeing should take a recognized place among those given at athletic contests, and the first steps in such a direction should be taken at school.

A FEW REMARKS ON SCHOOL HYGIENE was a short paper by DR. T. M. BRENNAN, of Montreal. The writer held that

" should such matters as that of hygiene in schools not be looked into, mankind may in a few generations more be nearly extinct as regards health, and men become merely walking columns of microbes, a conglomerate of all the actually known bacilli and a host of others newly hatched or spored by cross-breeding. What fun they would have with our cells! The only way to avoid such a perambulating microbic stage is to surround the child with all the protection available; make him strong for the combat." The satisfactory teaching of hygiene should be obligatory in all schools. All persons having charge of the rearing of children should have a sound knowledge of hygienic laws. The doctor described the " entombing of children in convents and colleges, over-crowded and often without any efficient hygienic supervision," as deplorable. He did not wish to insinuate that all scholastic institutions were unhealthy, for certainly they are becoming more inhabitable, and things are better than formerly; but he affirmed that there are great things left for hygiene to do, even in some of the best institutions. He had known girls contract grievous ailments from which they could have been protected by timely warning and proper care. No false modesty should arise and deprive the ignorant girl of her right to protection. Each punishment, too, should receive serious study from a moral and from a hygienic standpoint. The tobacco and alcoholic habits should be strictly dealt with, and their pernicious consequences brought out. This both in girls' as well as in boys' schools. In women the habit of tippling is far more prevalent and disastrous than is generally imagined. Within the last four months he had seen four women, each the mother of several children, and moving in good society, die from the effects of chronic alcoholism. The lecturer would like to see almost every child who enters school provided with a certificate from the family doctor setting forth the weak points in the child's nature. Nobody knows the constitution of a child better than the family doctor. In each school there should be a school physician endowed with power to act. There should be some system of general hygienic supervision. The support and co-operation of local and general boards of health and of the board of public instruction should be assured.

The next paper was on AN EPIDEMIC OF ONE HUNDRED AND TWENTY CASES OF PARALYSIS IN CHILDREN, by DR. ANDREW MACPHAIL, of Bishop's College, descriptive of an epidemic of infantile paralysis, which occurred in the State of Vermont during July, August, and September, and which Dr. Macphail investigated. He first stated that the belief was held that it was an outbreak of cerebro-spinal meningitis, but he showed in the clearest possible manner that it was a true myelitis. He quoted the notes of ninety-one cases out of the one hundred and twenty. In some children the paralysis came on without any symptoms, in others there was a preliminary illness of a few days, resembling indigestion. He described in detail the fatal cases, of which there were eighteen, and forty-two in which there was permanent paralysis. There were also notes of six cases in adults, three of which ended fatally. He then referred to the origin of the malady, with full statistics of temperature, rainfall and humidity, and geologic factors. There were besides twelve deaths from the same cause among horses, and fowls were likewise affected. In conclusion, he dwelt upon the necessity for having in every State a properly conducted laboratory and a competent staff to deal with such outbreaks, and a board of health with authority to investigate epidemics and perform autopsies. The paper had additional interest from the fact that this is the first epidemic of the kind reported in America, and the third which has occurred in any country. Dr. Macphail refrained from expressing any views or propounding any theories till the pathologic work which he has in hand should be completed.

It was followed by a paper entitled A PROVISIONAL ARRANGEMENT OF CAUSES OF DEATH, by DR. CRESSY L. WILBUR, Registrar of Vital Statistics, Michigan State Board of Health, Lansing, in which he explained the classification that he has adopted in the Michigan Registration Reports for temporary use, until a satisfactory modern classification shall be authoritatively introduced. Dr. Farr's system, the basis of the classification employed in most registration reports, is hopelessly antiquated. Many of its terms are obsolete, and some are at present understood in quite other than their original meanings. The plea of uniformity has no weight at

present in favor of the retention of Dr. Farr's classification, for scarcely any of the registration reports that employ it agree in the details of its use.

Two of the five great classes of Dr. Farr's original classification are especially objectionable at present—namely, "Constitutional Diseases and Developmental Diseases." The removal of tuberculosis, the type of the former class according to the pathology of fifty years ago, to specific infectious diseases, practically destroys the class. In like manner returns of "old age," "infantile" and "debility" should in most cases be regarded as equivalent to cause of death unspecified, and thus the class of so-called "developmental diseases," largely constituted of these indefinite forms, practically disappears. Such radical changes, rendered necessary by modern knowledge of the causation of disease, quite alter the relations of the old classes, and render a new system imperative.

The provisional arrangement illustrated was intended for use in Michigan in connection with the work of the State Board of Health. Deaths from disease (deaths from violence, unknown causes and still-births being separately taxed) are divided into two lists: (1) Dangerous communicable diseases, as defined by the State Board of Health under the State law providing for their restriction; and (2) diseases not so defined at present. The latter list contains certain specific infectious diseases, as pneumonia, that will probably be eventually included in the first list. The object at present is simply to illustrate the work of the State Board of Health in the prevention of those diseases which it has undertaken to restrict. Ultimately a classification of diseases may be made somewhat as follows, only the broadest outlines being suggested:

Total Deaths from all Causes.

A. Deaths from disease.

1. Specific infectious diseases, including all diseases in which the chief etiologic factor is one or more vegetable or animal micro-organisms.

2. Local or organic diseases, consisting of all those diseases dependent chiefly on changes in the anatomic or functional constitution of the body, and not due to a specific infection.

B. Deaths from violence.

The exact form that the new classification shall take is a matter that should be settled by the registrars—national, State, provincial, and municipal—who will be called upon to employ it in their reports. An Association of Registrars of Vital Statistics was suggested for the purpose of settling this question as well as many other points of practical importance in registration in which greater uniformity is desirable than at present prevails. Such an association would encourage a feeling of the dignity and responsibility of the work, and lead men of special fitness to engage therein. Comparison is essential to the proper interpretation of results in vital statistics, and this demands closer association and co-operation on the part of officers engaged in this work in different localities.

The next topic of interest was the report of the committee on nomenclature of diseases and forms of statistics, presented by the Chairman, DR. SAMUEL W. ABBOTT, Secretary of the State Board of Health of Massachusetts, Boston. The Chairman recommended that nothing be done until the various medical authorities throughout the country could be communicated with, and it was so ordered.

THE ADVANCES OF PUBLIC HEALTH IN THE CITY OF MONTREAL, by DR. L. LABERGE, Medical Officer of Health of the city, followed. He described the organization of the Health Department of the city and its history. Twenty-five years ago the Health Department of Montreal consisted of a few inspectors, who visited the yards and lanes and ordered the citizens to execute themselves the necessary cleaning. In respect of sanitary regulations Montreal had been moving backward since the days of its foundation. Under the French rules the representatives of the king prescribed to the people certain sanitary laws and ordinances which were quite sufficient to meet the requirements of such a small village as Montreal then was. The streets and yards had to be cleaned at stated periods, butchers were directed to deposit the offal of their stalls only in certain places, etc. By the English conquest, the officers whose duty it was to enforce these ordinances were removed, not to be replaced until many years afterward by a municipal government. The justices of the peace, whose duty it was to maintain law and order under the early English *régime*, felt that they had fully accomplished

their task when they had punished the more brutal forms of crime.

With such a system Montreal fell an easy prey to every form of disease. The death-rate varied from 35 to 43 per 1000 annually, and the city was indisputably the most unhealthy in the whole of North America.

The first attempt to remedy this terrible condition of affairs was made in 1874, when Dr. Hingston was elected Mayor of Montreal as the representative of the medical profession.

One of the first works undertaken to improve the hygienic condition of the city was the construction of the great sewer along Craig Street. In the early part of this century Craig Street was still occupied by a stream, which was the natural drain of the eastern and northwestern portions of the city. One of the branches of the stream started near the western extremity of St. Catherine Street and ran along the ravine now occupied by Ontario Street down to Parthenais Street, where it joined the streams coming from the north and east, then turning west crossed Papineau Road at Dorchester Street, and flowed into the Craig Street valley. The united streams then flowed west to Chaboillez Square, where they fell into the stream flowing east from St. Henry, and turning south passed through the hay market and finally fell into the St. Lawrence near Custom House Square.

This Craig Street stream having become a public nuisance it was inclosed, about 1842, in a brick sewer seven feet in diameter, which started from St. Lawrence Street and flowed west to McGill Street and down to the river. The eastern part of the city was drained by a sewer constructed along Lacroix Street in 1845, and another along Colborne Street. The object of constructing a new tunnel along Craig Street, flowing east from Victoria Square, was to prevent the pollution of the water opposite the city, and to provide for the future. The work was a difficult one, and it occasioned much discussion. It was finally completed on May 13th, 1878. It has a diameter of 8 feet and a length of 8765 feet, and cost $259,010.81.

The main sewers of the city are now considered adequate, but Mr. J. E. Doré, the City Sanitary Engineer, as well as other experts, complain of the large number of " dead ends"

in the system of small sewers, the effect of these being to stop the circulation of air and to cause the gases to come up in the houses. Mr. Doré also, in this connection, complains of the want of ventilation in many houses, and says that this is due to the fact that Montreal has no by-law on plumbing. Such a by-law has been prepared by the Health Committee, and it now awaits consideration from the Council.

The beginning of the scavenger system also dates back to 1877. The work was then done by the Road Department, and was done on a very modest scale, the appropriation for that purpose being only $7000. As a consequence of improved methods the death-rate has fallen from 37 per 1000 in 1872 to 24 per 1000 in 1892.

MR. J. E. DORÉ presented a report on THE VENTILATION OF SCHOOLS. Mr. Doré is a champion of mechanical ventilation. He concludes thus: Natural ventilation through the windows can be employed under certain climates; but here, where the difference between the temperature of the rooms and that of the outside is enormous, we do not believe that it is practicable. Under such conditions, the fresh air can only be heated by mixing with the vitiated atmosphere. And we have already said that it is highly important to avoid the mixture in so far as possible. The many arrangements devised, such as perforated panes, English double windows, the one open at the top and the other at the bottom, openings provided with screw wheels, do not change the situation. If by any means the mixture of the two airs is prevented, the result is that the fresh air arrives cold. There remains then only ventilation through chimneys and through mechanical devices. We believe that the most satisfactory solution can be reached by combining these two systems.

Mechanical ventilation in cities is not now as difficult to obtain as it was years ago. The motive power necessary to run the ventilator can be electricity, which is so conveniently and cheaply distributed. The plant costs next to nothing, and the running expenses are very low. As to the advantages of the system, they are so well known that we need not dwell on them.

We conclude that the mode of ventilation in buildings devoted to educational purposes is a mechanical system which

shall cause a current of from 400 to 500 cubic feet per pupil to circulate from bottom to the top, the fresh air having been heated before its introduction to about 5° below the temperature to be maintained in the room. The heating apparatus placed in the rooms to compensate the loss of heat through the walls should also be planned on this basis.

The remaining papers of the session were read by French colleagues, "LA MYOPIE DANS SES RAPPORTS AVEC L'HYGIENE SCHOLAIRE," by DR. A. A. FOUCHER, of Laval University, in which he showed that the disease was more prevalent in the secondary than in the primary schools, and suggested that greater attention be paid to the matter of lighting schools and the clearer printing of school-books.

"DURÉE PHYSIOLOGIQUE DU TRAVAIL AU POINT DE VUE INTELLECTUAL ET PHYSIQUE" was read by DR. L. L. FORTIER. The only participant in the discussion was Dr. Hopkins, of New York, who while willing to acknowledge the great importance of this question of hygiene in schools, drew attention to the difficulties of teaching hygiene. Some knowledge of the physiology of sex is essential, but how is it to be taught? "How," he asked, "are you going to give the growing girl of from fourteen to sixteen a complete knowledge of herself and still leave her her modesty? How are we going to crowd the amount of work necessary, to do all the study considered necessary now, in the short school hours demanded by fashion nowadays and still feel confident that she at the end of the school session will be physiologically and anatomically what she should be? How, too, are we going to remove that handicap from which the grown-up woman suffers from the time she puts on the long skirt which makes prisoners of her most important limbs until she goes under the care of the specialist? How are we to give her the advantage which her brother possesses of indulging in healthy recreation?"

The speaker furthermore said in the course of a long practice among children he had never found myopia caused by study either in school or out. The reading of cheap novels he believed to be more responsible for the existence of the trouble than study.

THE ELECTION OF OFFICERS.

THE MORNING AND ONLY SESSION OF THE FOURTH DAY was devoted to the hearing of the reports of the Executive Committee and other committees, and of the Advisory Council.

The report of the Advisory Council was as follows: *For President*, DR. WILLIAM BAILEY, of Kentucky; *First Vice-President*, DR. GRANVILLE P. CONN, of New Hampshire; *Second Vice-President*, DR. GREGORIAS MENDIZABEL, of Orizaba, Mexico; *Secretary*, DR. IRVING A. WATSON, of New Hampshire.

For three members of the Executive Committee to be elected: DR. HENRY I. BAHNSON, of North Carolina; DR. PETER H. BRYCE, of Ontario; DR. E. P. DE VAUX, of North Dakota.

Invitations were presented for the Association to hold its next meeting in Denver, Col., Minneapolis, Minn., and Banff Springs, Manitoba.

The Council recommended that the meeting in 1895 be held in Denver, Col.; to favor the acceptance of an invitation from Davenport, Ia., to stop one day in that city *en route* to Denver, to inspect the water filtration plant and other interesting sanitary features.

The Association was invited to hold its meeting in 1896 in the city of Nashville, Tenn. It was voted to indorse the invitation and to refer it to the next Advisory Council.

The following resolution was adopted:

"*Resolved*, That the question of publishing the Transactions of the Association quarterly be referred to the Executive Committee to arrange for such publication if the scheme be found practicable."

The report of the Council was, upon motion, unanimously adopted, and the Secretary was authorized to cast the vote of the Association for the offices named. The list of names upon the new Advisory Council and special committees was also announced.

Upon motion of Dr. Montizambert, a committee of two was appointed to escort the President elect to the platform. Dr. Montizambert and Dr. Gihon were appointed. Dr. Bailey said substantially as follows:

"*Mr. President and Gentlemen:* Those of you who know me well will I trust not be afflicted by this mark of appreciation on your part. In view of the honor you have conferred on me, I express to you my happiness and gratification. For fifteen years I have been a member of this Association, going about quietly and unostentatiously. I understand that your choice for the Presidency of this Association for next year has been by acclamation, yet withal I am fully conscious of my faults and weakness, therefore this administration cannot hope to rival or equal the one now about to close. I hope to rely on the good-will and receive the cordial support of the members, and I feel that this is the proudest hour of my life."

MEDICAL DIRECTOR GIHON, U. S. Navy, offered the following:

"*Resolved,* That the thanks of the American Public Health Association be cordially and earnestly given to His Excellency, the Lieutenant-Governor, and the Government of the Province of Quebec; to His Honor, M. Villeneuve, Mayor, and the Municipal Council of the city of Montreal; to the Federal Government; to the citizens of Montreal; to the authorities of McGill University; to Drs. Craik, Pelletier, and Baudry and their associates on the Local Committee of Arrangements; to the members of the press; and lastly, to Montreal's attractive sanitary exhibitions—the ladies—who demonstrated in their own persons the salutary and beatific influence of the Canadian climate, and who contributed so much to the entertainment of the members, and those who accompanied them."

The adoption of the resolution was unanimous.

TRIBUTE TO THE LATE DR. JOHN H. RAUCH.

Dr. H. D. Holton offered the following in memoriam of Dr. John H. Rauch:

"Since our last meeting, death has taken, in the person of Dr. John H. Rauch, one of the organizers and promoters of this Association, a man whose love of his fellow-man gave him enthusiastic zeal in the work of sanitation.

"We desire to place on record our appreciation of his inestimable work in the field of medical education, and in the organization and continued support of this Association.

While we mourn the loss of his personal friendship and the admonitions of his wise counsels, the memory of his devoted and courageous efforts in all the departments of his life work shall be an inspiration to us to take up the work he has left, with an increased devotion."

DR. MONTIZAMBERT moved that the resolution be adopted in silence, by a rising vote, which was so ordered.

A long list of papers and essays were read by title.

A paper, "A PLEA FOR ASEPTIC VACCINATION," was read by DR. M. T. BRENNAN, in which the essayist urged the necessity of performing vaccination under complete antiseptic conditions.

INFECTION BY THE BACILLUS PYOCYANEUS AS A CAUSE OF INFANTILE MORTALITY, with a report of cases, was the subject of a paper by DRS. GEORGE ADAMI and KENNETH CAMERON, of McGill University. The paper was read by Dr. Cameron, who briefly stated the main points: Popularly, pyocyaneus is known as "blue pus." Doctors were often surprised to remark that bandages of wound dressing became blue. For long the color was supposed to be due to ozone or something else. Bacteriology showed it to be due to bacilli. A European savant had had a case where it had resulted fatally. The three McGill doctors within a few months have investigated three fatal cases at the Foundling Institute. The bacillus was discovered and studied for the first time in America. Cultivations of these bacilli were introduced into the systems of rabbits by inoculation, and resulted fatally. Investigations had been conducted to ascertain whether vaccination against the disease could be used. Cultivations of the bacilli had certainly rendered animals immune. The cooperation of other practitioners in prosecuting the inquiry was asked.

The following are the author's conclusions:

1. That the infant tissues are susceptible to the invasion of the bacillus pyocyaneus.

2. That the bacillus is distinctly pathogenic, setting up a disease similar to the experimental pyocyanic disease.

3. That this disease is characterized by a train of very definite symptoms—namely, diarrhœa, fever, rapid emaciation, rigidity of the legs, and hemorrhagic bulbous eruptions.

4. That the disease appears to be very fatal, and this combination of symptoms occurs infrequently in young children, especially when congregated in nurseries and foundling asylums. We venture to infer that a certain proportion of the deaths which now appear upon our records of vital statistics under the heading of gastro-enteritis, purpura, or marasmus, are in reality cases of generalized pyocyanic disease. As to prophylaxis, nothing definite was offered, beyond the strict observance of the laws of hygiene, and that it is a disease eminently suited for trial of "serum therapeutics."

A paper on THE ETIOLOGY OF MEXICAN TYPHUS, by DR. JESUS CHICO, of Guanajuato, Mexico, the author claimed is a new contribution. The following is a brief abstract of the points noted. The author read a paper on the same subject at the meeting of the Association in Mexico in 1892. He maintains that the proportion of patients who contract typhus-fever without any previous communication with another patient suffering from the same disease is above 90 per cent; that the number of people who contract typhus when nursing one of its victims is exceedingly small, and that there is evidently a relation beween the ground and this ailment, because it is a fact that there are houses which are haunted by it, preferably to others, notwithstanding the care with which they are cleansed and disinfected.

In his new contribution he expatiates upon this topographical feature of the etiology of the disease, showing by several examples how its appearance and spread followed in the first case from excavations in the ground of the streets, and that in the second, spread of the disease followed the ground and not the atmosphere.

A vote of thanks was then, upon motion of Dr. Smith, of Maine, tendered to Dr. La Chapelle, the courteous and able "bachelor" President, the same being seconded by Dr. Mendizabal, and was suitably acknowledged by the retiring Executive.

The final paper was upon "The Evolutionary Developments of Domestic Plumbing during the past Thirty Years," read by MR. J. W. HUGHES, of Montreal.

The Association at 11.30 o'clock adjourned, *sine die*.

SANITARY ENGINEERING.

ABSTRACT OF LECTURE AT THE FRANKLIN INSTITUTE, PHILADELPHIA, FEBRUARY 15TH, 1895.

By WILLIAM PAUL GERHARD, C.E.,

Consulting Engineer for Sanitary Works, Member of the American Public Health Association, Corresponding Member of the American Institute of Archæology, Member of the German Sanitarian Society, Honorary Consulting Sanitary Engineer of the Department of Health of the City of Brooklyn, N. Y. etc.

THE lecturer began by defining sanitary engineering as a special branch of the profession of civil engineering. Centuries ago the whole science and art of building construction were concentrated in one profession. Referring to great men, like Michael Angelo, Leonardo da Vinci, and others, he recalled how they were painters, architects, sculptors, and engineers at the same time. Gradually the first division into the professions of architects and engineers took place. Civil engineering was defined as "the art of directing the great sources of power in nature for the convenience of men," and a brief *résumé* was given of the various works of the civil engineer. With the increased requirements of modern civilization, the tendency to specialization began, and nowadays engineers devote themselves to one particular field, such as military, railroad, hydraulic, mining, electrical, sanitary engineering, and other branches.

The purpose of all works of sanitary engineering is the promotion of healthful conditions which tend to reduce the death-rate and increase the health-rate of communities. A general knowledge of architecture and of civil engineering should form the basis of the education of the sanitary engineer.

The lecturer next described the usual and desirable course of study to be pursued. Following a general preparatory course in natural sciences and mathematics, in the principles

of construction, in the stability of structures, in draughtsmanship and in manual training, without all of which no engineer can attain eminence, the student should learn the rudiments of engineering as relating to commerce, to agriculture, manufacturing industries, mining, building, and public health. The sanitary engineer should also study sanitary science and everything pertaining to public and individual health, including first aid to the injured in accidents or emergencies, so common in the actual practice of the engineer. In practice, sanitary engineering covers a very wide field. The lecturer attempted to give a general outline of the problems which arise. He dwelt first upon the water supply of cities and of buildings, and showed how deficiencies in quality, quantity, or pressure might lead to disastrous calamities. Filtration of water and the desirability of a pure ice supply were referred to. Sewerage of houses, villages, towns, and large cities was next considered, with brief allusions to the different sewer systems, the many preliminary investigations required before adopting a sewerage plan, and the details of construction, such as flushing, ventilation, etc. The prevention of pollution of watercourses and the various methods of sewage disposal were briefly explained.

The lecturer next spoke of street pavements, from a sanitary point of view, of street cleaning and street sprinkling, of the removal of snow, of street dirt, and of house refuse, and of the various methods of collection and disposal of garbage.

The services rendered by municipal or by sanitary engineers in the laying out of cities were explained, and reference made to the different aspects of street architecture in American and European cities. The various systems of city traffic, the distinct subdivisions of cities into districts of different character, such as the business, shopping, manufacturing, and residential districts, were explained. The rectangular system of streets and long straight street lines were condemned as monotonous and awkward. The necessity of having plenty of public squares, parks, open spaces, and airing grounds in cities was explained, as well as the desirability of having rows of trees planted in the wider streets, all of which tend to increase the salubrity of a city by lessening street dust, removing street noises, maintaining a purer atmosphere, and affording play-

grounds for children and opportunities for recreation to the working people and the city poor. Water fronts of harbor towns or cities situated on the banks of rivers should be beautified and improved, and not form, as usual in American cities, their least attractive portion. All natural watercourses traversing a city should be kept unpolluted and should never be used as sewer outlets. The need of well-framed building and sanitary regulations for all cities was pointed out, and the services explained which sanitary engineers can render in the enforcement of city ordinances. The sanitary works mentioned form together a wide-scoped sanitary system, which provides safeguards for the public health and secures general town sanitation. Other sanitary problems, like smoke prevention, city cemeteries, cremation, drainage of swamps, prevention of inundations and storm-flood, and the sanitary influence of forests were briefly discussed. The lecturer furthermore referred to the sanitation of the dwelling, the protection of buildings against the elements, the problem of housing the poor in large cities, the planning of hospitals, prisons, and military barracks, the necessity of establishing people's baths in populous city districts, the requirements of safety from danger of fire or panic in theatres and halls of audience, and other problems.

He likewise touched upon industrial hygiene, the prevention of machinery accidents, the abolishment of nuisances, the regulation of offensive trades, the sanitation of summer resorts, the requirements of health for the travelling public, ventilation and sanitation of railroad and street cars, of ferryboats and steamship berths. He explained how a large part of the sanitary engineer's practice relates to sanitary examinations and surveys of dwellings, of building sites, and of whole cities. The sanitary engineer frequently is called upon to render expert service in litigation pertaining to sanitary works or sanitary patents, and in such cases the lecturer advised that experts should be retained by the court, instead of, as is now the custom, by both plaintiff and defendant.

Finally, reference was made to the special services rendered in cases of sudden outbreaks of epidemics, or of great disasters, like earthquakes, inundations, and destructive conflagrations, and to the duties performed by sanitary engineers

in case of war, the housing of the soldiers, the erection of temporary hospitals for the wounded, the maintenance of cleanliness in the camp, the sanitation of battle-fields, and the prevention of war pestilence.

The lecturer concluded with a brief allusion to the trades allied to sanitary work, advised the avoidance of sensational writing or advertising, and recommended that, inasmuch as sanitary engineers are by nature of their special training specially qualified and well fitted to be identified with public matters, their profession should in the future be freely represented in Boards of Public Works, of Health, of Education, of Charities, as well as in City Councils, City Improvement Societies, and Citizens' Committees.

THE LONDON WATER SUPPLY.

By MAJOR GREENWOOD, M.D., D.P.H., LL.B.

ONLY quite recently a special Water Commission reported that London had a good supply of suitable water for many years to come.

As a fitting commentary on this it is to be noticed that for some weeks past the East London Water Company has been compelled to cease giving a constant supply, as required by the law, and according to their agreement with the various local authorities of the metropolis, thereby giving rise to innumerable sanitary evils, and dangerously threatening the health of the Londoners.

The region chiefly supplied by this company includes a large portion of the poor property in the East End, and at the present time, at night, after 8 P.M., every drop of water is shut off from the homes of thousands of our artisans, at a time too when many of them return from their work to enjoy their evening meal, and when from the generally crowded state of the houses a free water supply is more than ever necessary. For it must not be forgotten that it is precisely during the time that the East London Water Company has

thought fit to deprive the rate-payers of their water, the water is most wanted, and, in fact, had it been cut off during a large portion of the day the loss would have been far less severely felt.

The company are doubtless well aware of this, but, had they followed the latter course, they know very well that such a storm of indignation would have been raised among a class who can protect themselves, that even an almost irresponsible company might have feared for the result, whereas they know practically they have little to fear from the class who are now being so cruelly oppressed. Nevertheless, from a sanitary point of view, very important questions arise—questions which at the present time, with cholera knocking at our gate, cannot be considered of little moment, and which any sanitarian, who honestly looks them in the face, must confess, threaten a terrible danger to the public. Although the class I have just referred to will often sit down quietly and put up with evils which one might think were all but intolerable, and, as far as their individual suffering is concerned, are long-suffering in the extreme, it must not be forgotten that this very patience is fraught with the utmost danger to the public health. At this period of the year, when diarrhœa is always more or less prevalent, what must be the state of hundreds of water-closets throughout some of the poorest and most crowded parts of London during the whole of the night? For years past it has been the endeavor of all medical officers of health to get the water to the water-closet in connection with the constant supply to prevent the danger of a contamination of the domestic water, which was often contained in the same cistern. Their efforts have been in most cases successful, with a result that, as all the water-closets have been removed from their previous connection with cisterns, the recent action of this water company has been to render *hors de combat*—that is, as far as any efficient flushing is concerned, the water-closet of every house in the region affected, whether the householders do or do not possess cisterns.

Under these circumstances it is obvious that if the cholera germ were once here, it could not hope for conditions more favorable for its development, and even without its importation I think I have indicated very imminent dangers to our

workers, and indirectly to the whole body politic, sufficient to excite the attention of all sanitarians.

When the enormity of the evil threatened is considered, that it is nothing less than the health of five millions of people, it will naturally be asked, Who are responsible? When it is answered that it is a private monopoly, which has always protested that it had plenty and to spare of water to fulfil its statutory duties, the thought that naturally suggests itself is that surely the law of this country does not allow the health of five millions of people to lie at the mercy of a practically irresponsible company. In the year of grace 1894 it seems hard to have to confess that this latter suggestion is far nearer the truth than the good people of the County of London would suppose.

It is true the various Water Acts would fill a volume, and terrible penalties appear therein to punish the guilty water company that fails to do its duty; indeed, in one of the most recent, its present conduct renders the East London Water Company liable to a fine of £200; but then this penalty is only incurred supposing the company cannot plead several excuses, which, as a matter of fact, it always can plead. Drought and frost are specially instanced, so that nothing is more easy for the East London Water Company to cut off its water with impunity in the winter, if it allege frost, and in the summer if it allege drought, as it does at the present time.

At the end of last year the Improved Dwellings Company, Limited, sued the East London Water Company for illegally reducing their pressure. They unfortunately lost the day, but the plea of the water company then seemed plausible enough. Since, however, we have had an unusually wet year, and we now find the same water company, emboldened by its success in that action, not reducing the pressure only, but actually cutting off the water entirely from a large portion of the town, and giving no other plea than what they alleged last year. What, indeed, can be the value of a water supply which is so reduced by one year of drought, that at the end of the following year it is necessary to take steps not considered necessary even during the year of drought itself?

The company, however, does not by any means admit without reserve it is unable to keep up its usual supply. It alludes

to the continual waste of water, and asserts that its recent action saves over twelve million gallons daily.

In other words, it implies that it has in a measure adopted its present procedure to check the waste which, it avers, is always going on. I have been carefully through all the enactments relating to the metropolitan water supply, and I altogether fail to find where the company obtains the slightest authorization for employing such means for preventing waste, indeed, at the time when these acts were passed I hardly fancy the company would have had the audacity to make such outrageous claims. Amply sufficient powers are given it to restrain any individual water consumers from wantonly wasting the water, and it is the duty of the company by means of careful supervision on the part of its agents to check improper waste of this kind, and in so doing they will have all the sympathy of the public. But what can be said even on the ground of common justice, apart from the sanitary question involved, of a practice of punishing the innocent with the guilty, rather than take the trouble to discriminate between them, and because a certain number of the rate-payers abuse their opportunities, ruthlessly restrict nearly the whole of the East End population in the use of one of the primary necessities of life —to their general inconvenience and the great detriment of the public health?

Then as to the saving of *twelve million gallons*, there might be two views as to this. If an already underfed population of some millions were to have half their food supply cut off, certain economists might be able to show by figures a wonderful saving of food; and it seems to me that this very saving of twelve million gallons so triumphantly pointed to by the company may not unlikely be direct evidence of the amount of distress brought upon a large proportion of our working population.

I know too that this cutting off of the water, although extended over a terribly wide area, is by no means universal—that is to say, that a rate-payer smarting under the loss and inconvenience occasioned by the company's action not unfrequently has the satisfaction of finding a neighbor, who has paid no more rate than he, and has no greater claim to exemption, entirely unaffected, and rejoicing in overflowing

pipes, when his less fortunate neighbor's are empty. Here, again, if this economy of the water were absolutely necessary, there are obvious grounds for public complaint. If A and B equally pay for, and are entitled to a certain commodity, which for the public good has to be economized, why should all the loss fall on A? It is obvious that if B had to bear his share, there would be more of the commodity in question for A, and that such a power of favoring individuals should be placed in a nearly irresponsible company is in itself an evil of no small magnitude.

In the terrible epidemic of cholera, some thirty years ago, which ravaged London, it was suggested this very company was spreading the disease owing to the *quality* of some of its water supply ;* it is quite within the range of possibility that the same charge might at a not remote future be brought against it on account of the inefficient *quantity* of the same, and I must maintain that this company is at the present time incurring a responsibility of no mean a character, and one which, if its directors cannot appreciate the nature, the public for their own sake should not be slow in demonstrating to it.

Surely, after this palpable breaking down of its water supply, it is time for London to come to a thorough settlement with regard to the water question. Sanitarians have proved beyond all chance of contradiction that a *constant water supply is an absolute necessity for the healthy life of a large town.* After the recent occurrence, can any one claim for London a constant supply as a matter of fact! The constant supply of London should be, like Cæsar's wife, beyond suspicion, and that can never be the case when one of the chief London water companies, after a single year of drought, is compelled to make an end of it, and actually ask that cisterns should be re-introduced into houses where they have been long discontinued. I even understand that they boast—for it is but a boast—that they can force the householders to erect these under their statutory powers. As the householders must have

* See Parkes' Hygiene, 6th Edition, p. 51 ; also Report of Medical Officer to the Privy Council for 1865, 8th Report, p. 438 ; and Report on the Cholera Epidemic of 1886 in England. Supplement to the 29th Annual Report of Registrar-General for 1881.

water of some kind, and must, perforce, put up with bad, if they can get no better, it is quite likely that they may be forced by such action as that recently employed by the company for their own sake to supply cisterns, but I must maintain it will be a most disastrous day for the health of this great city when the London water companies have been enabled by such illegal action to force into general use again a system which has over and over again been condemned by experience, and the opinions of those best qualified to advise.

The London County Council is anxious to spend the money of the rate-payers in putting down monopolies; it is already prepared to spend thousands in order to take over the tramways, and allow the poor to ride, instead of walk, at the cheapest possible rate. As science has certainly not yet proved that riding instead of walking is best calculated to increase the general standard of health among the working classes, while it has shown beyond all question that their health requires a constant water supply, would it be altogether uncalled-for to suggest that this anti-monopoly energy would be far better employed in attacking and overthrowing a monopoly which on no grounds of public policy can now be defended, and which, if it has in the past done great service in the development of the metropolis, has, at least, been well paid for its services, and at the present time can only be considered a dangerous incubus and distinct check on its sanitary development?—*Sanitary Record, October 6th*, 1894.

"WE," says the *Southern Practitioner*, has various significations, according to circumstances. For instance, when you read "that we expect our wife home to-day," "we" refers to the editor; when it is "we are a little late with our work," it includes the whole office force, even the devil and towel; if "we are having a boom," the town is meant; "we received over 700,000 emigrants last year," and it embraces the nation; but "we have hog cholera in our midst" only refers to the illness of the man who takes the journal two or three years without paying for it.

THE COLLECTION AND DISPOSAL OF REFUSE AND GARBAGE OF LARGE CITIES.

A PAPER READ AT THE MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION, MONTREAL, SEPTEMBER 25TH-28TH, 1894.

By W. F. Morse, of New York.

Extract.

THE DISPOSAL OF THE WASTE OF NEW YORK CITY.

THE conditions under which the waste of New York is collected and now disposed of present some features which are not found in any other city of this country. The situation of the city, bounded on three sides by deep water, affords an easy outlet to the sea for all waste by the cheapest of all conveyances—water carriage. The narrow and long strip of land upon which the city is built offers access to the water front with short distances for hauling the waste. Hence, the obviously simple and natural methods for easy disposal was, and is, to dump all waste at the water's edge into large flat boats and tow these to sea, discharging the loads beyond the shoal water of the bars and harbor mouth, and where the currents and tide would carry the floatable refuse off the land. The objections to this method are the storms and bad weather always experienced in winter, preventing the tows from going far enough from the land to dump, the consequent gradual filling up of channels and tide-ways by the accumulation of material which sinks when cast overboard, and the floating of that part of the waste which, when cast by the influence of the wind upon the shores, becomes offensive and obnoxious by decay and putrefaction.

To reduce the distance of sea carriage, and to create by the filling of vacant ground a site where future municipal buildings might be placed, the city began the deposit of the waste at Riker's Island, in Long Island Sound. After a few months it was found that the accumulation of large amounts of house-

hold offal mixed with the ashes and street sweepings created a nuisance ; that the odors from this mass of putrefying matter were insupportable even at the distance of a mile to the mainland, and that the upper part of the city was seriously affected by the objectionable smells. Harbor dumping was again resumed, and the offensive bulk of matters decaying on Riker's Island was disinfected by " electrozone," for obtaining which an expensive plant has been erected on the island. The difficulties and serious sanitary objections in this mode of utilizing New York City waste as the foundation for future buildings, and the experience gained this summer in the way of accumulating within the city limits, near to several thickly settled districts, thousands of tons of matter that will putrefy, will probably preclude the city from entertaining this method of disposal for the future, unless the laws of sanitation are more strictly observed.

The system of depositing the mixed waste at the mouth of the harbor is one which must be condemned on every ground of economy, utility, and public comfort. The cost is excessive, being 18 cents for each cart load ; the service is unsatisfactory, because of constant interference by stormy weather, and on account of the light and floatable character of a large percentage of the refuse, which is carried by winds and currents to the shores of Long Island and New Jersey, inflicting annoyance and nuisance upon an extended line of sea-coast.

It is obvious that some more scientific and thorough method of final disposal must be brought into use, and it is believed that no more satisfactory and efficient method can be employed than that of cremation.

It is proposed to destroy the putrescible organic waste of New York City by fire. It is proposed to do this within the city limits, at places where the collections of each district of the Street Cleaning Bureau are now received, or at some convenient point outside the city limits, where the *débris* can be utilized, and to do the work with economy, speed, and freedom from offence. In other words, the whole collection of garbage, refuse, ashes, and waste of all kinds is to be received, the valuable portions taken out, the offensive matter destroyed, and the residuum, after reduction to an innocuous condition, to be utilized for making ground.

At the outset it must be understood that cremation means destruction—not a process of treatment by chemicals, or the application of heat or steam to "render" garbage and manufacture a valuable product therefrom. Too often cremation has been confounded with "extraction processes," and the opprobrium attaching to this last method has been unfairly bestowed upon the former.

In 1893 New York City was reported as having collected 1,706,632 loads of waste. The sources from which these were received are as follows:

Collected by the Street Cleaning Bureau	1,089,409
Street sweepings	305,755
From public markets	10,368
From public parks, works, and docks	24,949
Ashes from factories, cellar dirt, builders' waste, etc.	276,151
Total number loads collected	1,706,632

If from this amount there be deducted the street sweepings, factory ashes, park and dock waste—606,855 loads in all—there will be left about 1,100,000 loads, which will represent the waste containing the mixed garbage and ashes that must be destroyed in its mixed condition, of which not more than 132,000 loads, or 12 per cent, may be said to be the garbage and organic waste which will putrefy and contaminate the whole bulk. This is collected in 58 different street-cleaning districts subdivided from 24 wards, covering an area 16 miles long by 2 miles wide, and brought to 16 separate dumps scattered along a water front of 28 miles.

The component parts of the city waste has been variously stated, but the following classification may be taken as nearly accurate:

Ashes, which include all miscellaneous refuse, tin cans, glass, crockery, iron, rags, clothing, straw, hay, house sweepings, and paper	60 per cent.
Street sweepings, manufacturers' ashes, cellar dirt, builders' refuse, etc.	23 " "
Garbage or kitchen swill	15 " "
Ice and snow	2 " "
	100 per cent.

Ice and snow, being hauled to the nearest dock and dumped into the river, may be dropped from the account.

Under the present conditions of collection no separation is made of this mixed mass of ashes and garbage; nor is a separation practicable unless made by the householder. When putrescible matter is once mixed with ashes, the liquids are absorbed, the particles of animal and vegetable matter are coated with fine ash which no methods can remove. It must be destroyed as it is.

The separation of the putrescible or organic matter from the ashes and refuse or inorganic matter, and the separate collection and conveyance of these two distinct classes of waste, are questions which will take some time and a good deal of patience and money to settle. By the report of the Health Department there are 39,138 tenement-houses in New York City, containing 1,152,414 inhabitants. To enforce an ordinance or regulation compelling a separation of the putrescible from all other waste in these tenements is something which is so difficult and burdensome that it will be found practically impossible. Moreover, there is no good reason for it. The amount of the garbage relatively is so small, its value for reduction to fertilizers is nothing, since it contains no animal matters, and the work of enforcing a separation will be so expensive that the "game is not worth the candle." A separation of garbage in the central part of the city, from eighth Street north and between Third and Ninth avenues, can be made by the co-operation of the police and the enforcement of strict regulations; but in the remaining districts it is not a wise measure nor a necessary one.

It must be remembered, a separation of the garbage will nearly double the expense of collection. The same cart cannot collect and transport the separated ashes and garbage in the same time that it would collect and deposit the mixed mass. Though the bulk is the same, the necessity of conveying separately will almost double the cost of the work. Moreover, there must be double the number of unsightly garbage and ash receptacles, which are now too prominent objects along most streets. At the side of the ash barrel place a smaller iron can containing the garbage; leave both from early morning to await the advent of the collector in the afternoon. Allow the bone and rag scavenger to overhaul and scatter the contents of the vessel over the walk, let the wind give circu-

lation to the scattered paper, dust, and ashes, and the walk for every 20 feet burdened with these boxes, baskets, cans, barrels, or piles of *débris*, and you have a fair sample of the streets and walks of the tenement district under the separate collection system.

It will increase the nuisance, difficulty, and expenses of the present mixed collection, with no corresponding benefit either to the city or the people. It is calculated that from 700 to 800 tons daily is the amount of household swill or garbage that is produced in New York. There is at least one third as much more coming from hotels and restaurants, which is now taken out of the city as food for animals, an equivalent in money or service of some kind being paid for it. As long as this is removed without conflict with the sanitary regulations there can be no objection, and this must remain as private property, not to be interfered with.

There is another element of value in New York waste that must not be overlooked. The city now receives $90,000 per year for the privilege of picking out the rags, paper, bones, iron, glass, clothing, etc., from the waste as it is shot from the carts to the decks of the dumping scows. This process, filthy and dirty as it is, can be under proper management made a legitimate source of revenue, with no chance for the spreading of disease if the selected matter is properly disinfected. There is a considerable value in much of the waste, but it must be rendered perfectly safe and harmless before it is allowed to be brought back to the city or sold as old junk.

To dispose of the 700 tons of garbage and of that part of the mixed garbage, ashes, and refuse which cannot be economically or successfully separated, cremating plants are required, which shall be capable of caring for the whole of each day's collection. These may be placed at each of the collection points or dumps, and these in turn may be lessened in number by consolidation from 16 to 12.

Connected with each cremating furnace is a steam-boiler, taking the heat from the furnace and operating machinery for screening, lifting, sorting, conveying, disinfecting, and burning.

Cremators fed with combustible waste under forced draught will furnish steam power far in excess of their own demands. Exactly what this amount may be is not yet ascertained.

The average ash-bin and refuse collection of waste which supplies the fuel for the English destructors is about one tenth the calorific value of an equal amount of coal. In this country the value is not so large, because of the excess of moisture in the garbage and the less burnable cinders in the anthracite ashes; but the difference is made up by the larger amount of combustible refuse, which is far greater here than abroad. Taking 10 pounds of garbage and waste as equal to 1 pound of coal, the practical value of 700 tons of garbage as fuel would be equal to 70 tons of coal, equivalent when consumed to the production of 2800 nominal horse power for ten hours.

But it must be noted that the character of garbage is uncertain and the supply intermittent and irregular, both being dependent upon conditions which cannot be accurately foreseen or controlled; hence, the amount of power to be obtained from such fuel must be taken with a liberal allowance for variation. For all of its own wants a cremator can furnish its own power, and a large if somewhat uncertain yet valuable surplus for other uses.

The destruction of the most offensive city waste can be perfectly well done without nuisance of smoke, odors, or the discharge of ashes or dust from the stack, provided the proper construction of furnace is employed, the fuel completely consumed, and the gases resolved into carbonic acid gas.

An example of the perfectly successful operation of garbage cremation was afforded at the World's Columbian Exposition, where two cremators of the Engle pattern, in continuous operation for six months, destroyed all the garbage and sewage sludge produced by the presence of 27,000,000 of people.

The work was performed within the grounds, under the continual inspection of thousands of persons, without nuisance of smoke, odors, or offence of any kind, and to the entire satisfaction and approval of the authorities in charge, who recognized the value of the method by the award of two medals and diplomas of the highest class.

There are now forty-six cities and towns in this country that employ cremation as the means of disposal of the waste, and this number is almost daily increasing. It is true that instances have occurred and are being repeated where garbage

furnaces of crude or experimental construction, unskilfully managed, give off smoke and fumes, and may constitute a nuisance in the legal meaning of the term. Many places have allowed the erection of furnaces which no human power can successfully operate or keep free from nuisance. Just at the present time the difficulty is to distinguish and disentangle those methods which experience and a record of continuously successful service have shown to possess real value from the great variety of new and untried inventions and schemes that are urgently thrust upon the attention of any one who shows the slightest interest in the subject, each of these new ideas promising to outdo and distance every other competitor, and dispose of garbage at next to no cost, and with enormous prospective profit to the capitalist who may be credulous enough to support them financially.

On the other hand, examination by competent persons will demonstrate the fact that with garbage cremators of approved construction, tested by long experience under severe conditions, it is as practicable to establish and successfully operate a plant for burning waste as it is to make gas or maintain an abattoir.

The cost of operating garbage cremators is a most important item to take into account, whether the work is to be done by the city or paid for by contract. The charge has been made that cremation, even when satisfactory in all other respects, is too expensive to be employed; that besides the destruction of valuable matter which should be saved to enrich the ground, the consumption of fuel and the cost of labor and repairs bring up the sum total to a figure beyond what any municipality should be warranted in expending.

Taking the report of the English "destructors" lately published, there are forty cities destroying waste by cremation, at an average cost of 30 cents per ton for fuel and labor. In several places the heat is utilized to obtain power for manufacturing fertilizers, pumping sewage, compressing air, grinding forage, and other purposes. In one city the power generated by burning garbage is utilized as an auxiliary for electric lighting. In most places the ashes are used for making mortar, and everything that can be turned to any useful purpose goes to diminish the cost of operating. In one place

only is the "destructor" made self-supporting. The claim that "the waste of any city, when properly burned, is sufficient to supply each inhabitant with an electric light of 8 candle power for two hours every night in the year," has not yet been realized, though great advances have been made. As better methods are provided for obtaining and employing the power, the cost of operating is being steadily diminished, and the usefulness of cremation proportionately increased.

The cost of operating the cremating plants in this country varies widely, being governed by the character of waste destroyed and cost of fuel. Most of the work is the disposal of household waste unmixed with combustible matters, and containing from 50 to 80 per cent of liquids in suspension. Many furnaces destroy night soil as well as garbage, considerably increasing the cost of operating, as this is always in a fluid condition. When the waste includes combustible matter less fuel is required and the expenses are greatly reduced. The labor item is nearly a constant factor, averaging $1.50 per man per day. The fuel may be coal, from 25 cents per ton for slack or culm to $5.10 for anthracite coal, wood at $2.50 to $4 per cord, natural gas, or crude petroleum oil, at 1½ cents to 3½ cents per gallon. No average can be made of the cost of maintenance, since the situation changes with each place and depends upon conditions which are altogether local. The reports from various cities show the cost to be from 40 cents to $1.10 per ton for kitchen offal containing large quantities of water unmixed with combustible waste, and 9 cents to 20 cents per cubic yard for miscellaneous garbage and mixed material.

The ashes from the combustion of household garbage are proven by many analyses to have a positive value. The use of these ashes in many parts of the country under varied conditions shows a value equal to the hard-wood ashes of commerce, and they are now regularly sold, and take their place in the list of commercial fertilizers. It may fairly be said that the screened crematory ashes of house offal, kept dry and properly cared for, are worth $10 per ton, a rebate of some magnitude to apply toward the cost of maintaining the cremator.

The Disposal of the Waste Outside the City.—The amount

and value of the ash and cellar dirt collection of New York City as a material for making ground must enter into any calculation regarding the disposal of the city waste. In 1893 there were 84,565 loads used for filling lots, and 1,629,262 loads sent to sea and disposed of behind bulkheads.

Assuming that the organic putrescible matter be destroyed by fire, and the residuum of mixed ashes, cellar dirt, and street sweepings be used for filling ground, there would be approximately 1,800,000 cubic yards to be conveyed away from the city and deposited upon vacant ground. The estimated value of this amount at 10 cents per yard is an argument against sea-dumping which cannot be set aside. Why should the city pay 18 cents per load, to throw this into the ocean, when the same waste reduced to an innocuous condition is worth 10 cents for filling ground, and can be transported to the place of deposit at one half the cost of towing to sea?

An extract from the report upon this subject, made in October, 1892, by the Special Committee, Comptroller Myers and President Barker, of the Tax Department, may be quoted as giving the results of the investigations then made:

"Apart from all economic considerations, the necessity of keeping the waters of New York Bay unpolluted by highly objectionable material would, in our opinion, alone be sufficient to condemn the present system as primitive and unworthy of the administration of a great metropolis. . . . We believe that it is as much the duty of the Commissioner of Street Cleaning to make a satisfactory final disposition of this material as it is to provide for its collection and removal from the streets. . . . The cremation of garbage may be, and we believe will be, an accomplished fact in the near future. . . . In 1884 the city of New York bought Riker's Island, consisting of 87½ acres, for $180,000, and in 1885, by act of the Legislature, the State of New York granted to the city of New York land under water surrounding that island, and included in a 12-foot contour line, with the right to crib in, fill up, and make additional dry land to the extent of 394 acres more. The average distance of towage involved in the matter of transportation to Riker's Island is less than one half of that involved in the system now in force. Riker's Island is a

point accessible on each tide. Complaints of severe weather and the straying of boats and sinking of tugs at sea while conveying material to the dumping-ground would not be heard, and the necessity of piling up and accumulating this material, with the resulting extra expense of rehandling so frequently occasioned by bad weather, would be entirely obviated. It is estimated that the saving which would be effected by the adoption of Riker's Island as a place of final disposition would amount to nearly $180,000 per annum, or $613,711.90 during the period for filling in these lands under water."

There is no interruption because of bad weather in the disposal of garbage by cremation. When last month the dumping service was suspended, and the accumulations of garbage became troublesome, there could be no relief except by resumption of the towing service. Such a state of affairs could not occur by cremation. No weather could stop the furnaces, the ashes can be handled and scows loaded under all conditions. As the cremating plants would be duplicate, no ordinary stoppage for any reason can interfere with their work.

The disposition of the putrescible waste by cremation can be more economically performed at one central point, like Riker's Island, than can be done at 12 or 16 places in the limits of the city. The expense for ground to be occupied by furnaces in the city, the corresponding expense for maintenance of many separate furnaces, the possible chance of annoyance or trouble which might occur from unskilful or inattentive management of the cremators, the saving of expense in short tows—these and many other considerations would suggest that the waste be conveyed away from the city, a considerable part reduced by extraction or reduction process to a valuable residuum, the mixed mass of combustible and putrescible matter rendered innocuous by fire, and the remaining *débris* and ashes used for making ground. This is the practical and business-like method which will give relief to the city and insure the final disposal of the waste with the greatest economy and efficiency.

The experience attained by nearly twenty years' use of garbage-destroying furnaces at forty cities in Great Britain, and by forty-six different places in the United States during seven years, has proved beyond any fear of contradiction that the

incineration of worthless waste can be performed by furnaces constructed upon scientific principles and managed by skilful men, in a manner that shall afford complete immunity from nuisance, be able to do the work equally well upon a large scale as a limited one, and destroy not merely a part, but all of the worthless matter which is produced by any community.

The difficulties to be surmounted in applying cremation for the disposal of New York City waste are, in the largest degree, mechanical and engineering problems. Given a cremating furnace burning 50 tons of garbage without nuisance and within a given cost, there can be no reason to suppose that the same methods applied in a larger furnace would not be able to destroy 100 tons at the same or even less cost.

The apparatus for handling this larger quantity by labor-saving devices is at the command of every engineer. It is only a question of the use of machinery in the most efficient and economical way for receiving the waste and conveying away the products of combustion for utilization.

There is no doubt of the capacity of a garbage cremator for steam-making power, and if the problem of saving and employing this power has not as yet been fully worked out, the progress made in this direction will soon show sufficient saving to render the operation of cremation self-supporting.

The advocates of cremation do not believe in destroying material that is of value and service to mankind, provided its transformation into non-offensive and valuable products can be done as economically and with as little offence as it can be burned; but they do believe that in the present stage of experimental progress that cremation possesses advantages which no other methods have yet acquired.

SEWER-AIR AND DIPHTHERIA.—A correspondent of *The Lancet* writes that a year or two ago a new system of main sewerage with the ordinary road-level ventilators was inaugurated in one of the suburbs of London, and upon its being brought into use serious cases of diphtheria almost immediately began to break out. The medical officer of health at once had the drains flushed with a strong solution of perchloride of mercury, and the cases then stopped almost as quickly as they commenced.

A FEW WORDS ON THE PREVENTIVE TREATMENT OF GOUT.

By F. W. Donlin, M.D.

In the intervals between the attacks in gouty subjects more can be done by judicious management, in protracting the length of time between seizures, than is generally considered. I am certain that if a proper diet and regimen be carried out during the intervals, these will be rendered longer, and the attack, when it does return, will be much less severe.

The patient who has had his first attack of gout should, on recovery, make up his mind to eschew eatables and drinks of every kind which may have the slightest tendency to favor a return of the disorder. The diet should consist of the most easily digested substances—chicken, rabbit, mutton, tender beef, fish of the white kind, such as codfish, halibut, and such like. With vegetables potatoes, greens, spinach, etc., may form the patient's diet, while salmon, eels, herrings, mackerel, and other fish of that description, as well as pork, veal, duck, goose, all potted or salt meats, and all rich or highly seasoned dishes must be scrupulously avoided, as must eggs and all dishes into the composition of which they enter. Asparagus and tomatoes must be avoided. The same may be said of cheese, nuts, dried fruits, and preserves.

Gouty persons require a very considerable amount of fluid to eliminate the waste products of the system, but the fluid should not be taken in any considerable quantity with or immediately after meals; a small quantity, however, may be taken toward the end of a meal. Through the day, however, large quantities of Highland water should be drunk, preferably hot. A large glass in the morning on rising, one an hour before each meal, and half an hour before retiring at night. It may be also drunk *ad libitum* through the day, and whenever thirsty. Malt liquors in every form must be avoided, and all sweet wines. Milk should be used very sparingly, and alcoholic drinks should only be taken if their use is approved

by the physician, and then in very small quantities, always diluted with Highland water. Gin is probably the best form in which alcohol can be taken in this affection.

The greatest care should be taken to keep the bowels acting regularly, and when there is any disposition to costiveness, the following modification of the old and celebrated prescription of Sir Charles Scudamore is the best that can be employed for their regulation :

℞. Magnesiæ	ʒ ss.
Magnesiæ sulphatis	ʒ ss.
Vini Colchici rad	♏ xx.
Syrupi Zingiberis	ʒ iss.
Aq. ad	ʒ ij.

M.

Fiat haust.

By following out the measures advised above, and especially avoiding indiscretions in eating and drinking, very marked benefit may be derived by persons of the gouty diathesis.

NATURAL MINERAL WATERS.—Discussion at the Paris Academy of Medicine became somewhat attenuated during the outing season, so much so in fact that at a recent meeting the topic had dwindled to artificial aeration of natural mineral waters. The methods of bottling in vogue at certain springs were condemned, and the government was requested to interpose the following precautionary regulations : 1. The sale of mineral waters which have been decanted, or artificially rendered gaseous, shall be prohibited. 2. Every application to the ministry for authorization must be accompanied by the certificate of a competent official that the water has not thus been already manipulated, and by the written promise of the proprietor not to resort to these processes. 3. Reservoirs must be hermetically closed, and should be emptied at least every twenty-four hours ; they are to be so placed that the spring flows direct into the reservoir. 4. Bottles must be thoroughly sterilized before being filled, and all causes of pollution during bottling are to be most carefully avoided.

MEDICAL EXCERPT.

By T. P. Corbally, A.M., M.D.

Gold as a Medicine. — Dr. A. H. Ohmann-Dumesnil, Professor of Dermatology and Syphilology in the Marion-Sims College of Medicine, St. Louis, in a contribution to the *N. Y. Medical Journal* of February 2d ("The Gold Preparations in some Skin Diseases and Syphilis"), very properly states that "there are so many preparations of a novel nature, or which are merely revivals of old ones in a new form, being daily offered to the medical practitioner, that he is often at a loss whether to use any of them. Not content with the inherent qualities of these preparations, their promoters either vaunt them as universal panaceas or construct the reading matter so clumsily that one naturally inclined to test the efficacy of the drugs calmly puts them aside until such evidence is forthcoming as will prove convincing and be clearly set forth. It is for this reason that clinical experience is so valuable when based upon careful observation and a knowledge of the conditions present.

"Our knowledge of the therapeutical action of gold has, up to within a few years, been based upon the hypothetical dicta of the alchemists. Gradually the matter was taken up again, at first by the Arabian physicians and afterward in Europe. Once more it fell into disuse, and was rescued from oblivion by Hahnemann, who introduced it in his pharmacopœia. However, this did not give it much of an impulse, and it is only of late years that this metal has undergone any serious investigation concerning its therapeutical properties. Among American investigators, Bartholow, Heneage Gibbs, and Shurley are the most prominent. Dr. Shtcherbok has made thorough investigations also.

"The most active salt of gold is the bromide, and it is particularly so upon the nervous structures, but small doses being necessary to produce effects. The action of gold is essentially that of an alterative. It has no cumulative effect; but, when toxic doses are administered, mental excitement,

amounting to delirium at times, manifests itself. A prominent symptom of its excessive action is an excessive flow of saliva, the so-called *aurism.* Remembering this in connection with the fact that very small doses produce the effects of the remedy, more especially in the form of the bromide, some care should be exercised in its administration. Among the therapeutic effects of gold may be noted the fact that it is tonic, more especially to the nervous system, and this accounts for the fact that it is an aphrodisiac of no mean power. It was highly esteemed many years ago as an antisyphilitic, and recent experience confirms this view, more especially in the later forms of the disease.

" The cutaneous troubles in which I have had occasion to employ the gold preparations to any extent are limited. In acne and eczema of a subacute or chronic character I have found arsenauro an invaluable adjuvant. On the other hand, in chronic eczema and in the later manifestations of syphilis mercauro has proved itself almost a specific, so much so that its administration was always attended by marked improvement, which ceased so soon as it was discontinued. This it was which attracted my attention to the gold preparations, and in investigating their therapeutical properties I have been impressed by the fact that the most active as well as most efficient salt of gold is the bromide. It not only acts powerfully when administered alone, but seems to increase the therapeutic effects of arsenic and of mercury, and for that reason much smaller doses of these agents may be given, better results obtained, and, at the same time, security from toxic effects will be secured. These are the qualities which recommend the preparations mentioned above, which are true chemical combinations and not empirical mixtures."

And here follows a citation of several cases of the good effects of gold preparations in diseases of the skin and in syphilis, as " sample cases from a large number of similar ones which have terminated favorably under the influence of the gold preparations mentioned. One feature which has been particularly noticed in connection with mercauro is its marked aphrodisiac properties. While only male patients have mentioned this, no doubt the female ones experienced similar sensations or exhilaration. This latter has been alluded to by a

number of patients of both sexes. There is no doubt in my mind that the bromide of gold is the most efficient salt of the metal, and it appears to exercise a twofold effect therapeutically—viz., it increases the action of the arsenic and mercury with which it is combined, and at the same time it seems to prevent the manifestation of toxic symptoms. It is itself very efficient, if we are to believe competent authority, which states positively that bromide of gold is thirty times as efficient as the other bromides.

So far as the preparations mentioned are concerned, they are efficient and rapid in action and the manifest effects of the gold are evident. An exact dosage by means of measuring the drops is attained and ease of administration is secured, no disturbance of the stomach resulting from their ingestion. The vertigo which is experienced disappears as soon as the dose is diminished. I have had no occasion to observe aurism up to the present. In fact, I have seen none but the good effects of these gold preparations. One point, however, must always be borne in mind. The indications presented must be such as demand gold. Some of the older writers maintained that gold was the remedy for syphilis, whereas it is only in the later and deeper manifestations that its good effects are shown. Furthermore, gold and its preparations will not have good effects in all skin diseases, but will prove a most valuable adjuvant in such as have a distinct neurotic base as an ætiological or complicating factor.

TYPHOID-FEVER.—The following facts were presented to the recent Congrès Français de Médecine Interne (*Le Progrès Médical, November 17th*, 1894).

M. Moussous, of Bordeaux, considers typhoid-fever in children as generally less severe than in adults. In the Children's Hospital in Bordeaux in sixty cases M. Moussous had only one death. His treatment was as follows: Calomel as a purgative every third day, on the intermediate days, and after the suspension of the calomel on the twelfth day, intestinal antiseptic treatment. Every day three abundant acidulated (*vinaigrées*) lotions and two injections of boiled water, given cold. In the ataxic and adynamic forms cold baths, abundant drinks, and milk diet.

M. Glénard, of Lyons, said with regard to the *treatment of typhoid-fever*, as now universally accepted by *means of cold baths*, it greatly reduces the mortality, and is applicable to all cases alike, either in the city or in country practice.

Regarding *desquamation*, M. Wall, of Lyons, has found it very frequent in children; he had thirty-three such cases in thirty-seven patients. The desquamation is most abundant about the trunk, at the origin of the extremities, on the neck, and in the armpits. Generally it is furfuraceous; sometimes it is in lamellæ, and more rarely it falls off in large flakes.

It may make its appearance at any period of the disease; it is of little diagnostic or prognostic value. It is a phenomenon that may be classed with changes in the nails and the falling off of the hair.

On the use of *poultices* in typhoid-fever, M. Montagnon, of Saint-Étienne, has employed them with *guiacol* in many cases, and has observed that this combination aids diuresis.

M. Lacroix employed poultices of guiacol in three very severe cases in children. The poultices were renewed every four hours, and all the patients made satisfactory recoveries.

SALINE DIGESTION—A STUDY OF ITS CAUSES.—M. Dastre (*Le Progrès Médical*, November 24th) designates as *digestion saline* the ensemble of the transformations caused in the fresh albuminoids in the presence of saline solutions. By means of crucial tests he has demonstrated that this digestion takes place independently of all ferment and of all microbes.

GLYCOGEN—ITS PRESENCE AND MODE OF DISTRIBUTION IN TUMORS.—M. Brault has recently made a report to the Académie de Médecine of a study (*Le Progrès Médical*) according to Ehrlich's method, based on the coloration with iodine of the quantity of glycogen in different tumors. He has observed the fact that the *proportion of glycogen in a tumor is in exact proportion with the rapidity of its development.* The quantity of glycogen may then serve as a measure of the force of the proliferation of an epithelioma, and consequently help to establish the prognosis.

STERILIZED MILK FOR TRANSPORTATION has engaged the attention of the Société de Therapeutique (*Gazette Hebdoma-*

daire, November 20th, 1894), and by common accord the members decided against the wisdom of furnishing an army in distant countries with sterilized milk preserved in bottles. Condensed milk has rendered and still renders great service in the marine service, and it is the best kind for the use of our troops in the colonies.

CORYZA.—M. Maurel (*Gazette Hebdomadaire*, November 20th, 1894) has proposed a remedy for coryza which is both simple and easy of application. He introduces into the nostrils a little cotton which has been impregnated with iodoform powder. He also recommends pastilles of five milligrams of iodoform; he thinks that the saliva, impregnated with iodoform, gives iodoform vapors in passing through the posterior nares; this supposed vapor reaches, by a retrograde movement, all the nasal fossæ, and destroys the white staphylococcus which is the specific cause of coryza.

SYPHILITIC GLOSSITIS WITH LENTICULAR LEUCAPLASIA.—M. Mendil (*La France Médicale*, November 23d, 1894) reports that in the month of July last he presented to the Société Française de Dermatologie et de Syphilographia the same patient whom he again brought before the Société, because the lesion of the tongue still existed in all its former intensity, notwithstanding the continued specific treatment, which consisted of 3 grams of the iodide of potassium and two of Dupuytrens pills a day. A few months before it seemed to yield a little, but the improvement lasted for a short time only.

The furrow in the median line of the tongue was very deep, and covered with numerous little elevations.

On each side of this furrow, over a mucous surface which was very nearly natural, numerous spots existed of a grayish white color, elongated or round and lenticular. These spots were slightly raised and seemed to be formed by the union of small exudative masses, over which the mucous membrane was grayish.

The tongue seemed to the patient to be thickened, but it gave little trouble. The lesion of the tongue had lasted fifteen years, and the syphilis twenty years.

METHYLSALICYLIC ETHER—ITS PRESENCE IN SOME NATIVE PLANTS.—The fresh roots of the *Polygala Vulgaris*, a common plant in our (France) fields, when crushed between the fingers gives a distinct odor of methylsalicylic ether.

M. Bourquelot (*Le Progrès Médical*, November 24th, 1894) has demonstrated the presence of salicylic acid, by means of its characteristic reaction with the perchloride of iron, which gives a violet color, more or less vivid. Besides, he has isolated the salicylic acid, and has obtained the soda salt.

As the characteristic odor of methylsalicylic ether can be perceived but for a few minutes after the branch has been broken or crushed, it is probable that the principle is found to exist in combination, and that it is liberated, like many analogous principles, under the influence of a soluble ferment. However that may be, M. Bourquelot has not been able to collect it; but he has determined that the product of the Polygala root and of the *Monotrapa hypopitys* have the property of doubling the amygdaline when an aqueous solution of this glucoside is added, a circumstance which indicates that these substances contain a ferment analogous to the emulsine.

THE HYGIENE OF THE KIDNEYS.—Dr. J. Henry C. Simes, of Philadelphia (*Diet. and Hyg. Gazette*, January, 1895), calls attention to the relation between the skin and the kidneys, and observes if the skin is not in a healthy condition the kidneys have an extra volume of work to perform. The importance of a healthy action of the kidneys is manifested by the fact that serious trouble may arise in other organs, as heart, lungs, brain, and nervous system, when the excretory work of the kidneys is imperfectly done. In watching the action of these organs many factors must be taken into consideration, such as the nature of the diet, the amount of liquids consumed, the nature of the exercise and activity of perspiration. Then again, as the urine varies so much, a correct examination cannot be made unless the entire amount voided in twenty-four hours be collected, and a specimen taken from this. The quantity of urine varies greatly with the amount of liquids holding the solid constituents of the food in solution. When it is remembered that nine hundred and fifty parts of every thousand of the urine are water, the importance

of this element in the dietary becomes evident. On this point, the author is strongly of the opinion that the majority of men eat too well and do not drink enough water. As a result of this, there is deposited in the tissues many effete products that should be carried off by the kidneys. The work done by those organs is in this way interfered with; and in time organic diseases often come on. It is owing to the large amount of water that much of the benefit from a milk diet arises. In advocating the use of abundance of water with the solids, the author again calls attention to the danger of washing down the food with it, and taking time to masticate properly. While water is of prime importance, it cannot take the place of the saliva. The benefit derived from a sojourn at a mineral spring is almost entirely due to the flushing out the system gets. Waste products are dissolved and washed away by the kidneys. The opinion is expressed that pure water drank for a lengthy period would have as good an effect. This of course applies to cases where there is no organic lesion, and the efforts are directed against the ill-effects of a sedentary life and over-eating. In advocating the use of water, its excessive use must be guarded against. The habit of taking too much water may be indulged in. This is the other extreme, and may result in harm. The effect of water is to make the kidneys act, and by over-drinking these organs may be over-worked. The abuse, therefore, of water may prove the reverse of *in aqua sanitas*. In the cold season, warm clothing is of much value, as tending to prevent congestion of the kidneys. Should such happen, it must be relieved by acting upon the skin and bowels. Judicious bathing is useful, as tending to maintain the healthy action of the skin, and thereby avoid congestion of the kidneys. If many people drank more water, and used less solid food, kidney diseases would not be so common as they are at present.

EDITOR'S TABLE.

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☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

THAT THE ANTITOXIN TREATMENT OF DIPHTHERIA has greatly reduced the mortality from that disease there seems to be no manner of doubt except by "Dr." U. S. Senator Gallinger, of New Hampshire, and a few learned newspapers. Nevertheless, there is a saving clause in the senator's opinion whose light reflects the dawn of the nineteenth century. He predicts similar results to the use of antitoxin serum to those which followed vaccination; though he qualifies this by saying that "No one can lay his hand on a person and say that he was ever the better for being vaccinated. It benefits nobody but the doctors. The highest authorities on medical science testify to the worthlessness of vaccination." Had he but said "predicted of" instead of "followed by" vaccination, he would have vindicated the science for which he contends. Because all readers, whether doctors, senators, or others, know that it was predicted of those on whom vaccination was practised at the time, by the scientists represented by Senator Gallinger, that they would bleat like calves, have horns grow out from their foreheads, and bellow like cattle. Had the senator but mentioned these common results of vaccination, according to the predictions and realizations of the highest authorities within the scope of his knowledge, he might have altogether ignored the considerably more important knowledge acquired during the century since vaccination has been practised—namely, that the death-rate from small-pox per million of living, among the most highly civilized peoples throughout the world, has been reduced from about two thousand annually for the century before the practice of vaccination to about one hundred annually for the century since it has been practised. This fact, we say, the senator might have altogether ignored (as he *did*), if he had only gone a little more into the particu-

lars of the results of vaccination as pictured by his scientific lore and drawn from them the results to be anticipated from the blood serum of horses.

The reduction of the death-rate from diphtheria by the antitoxin treatment is variously stated.

In Germany, where the fatal cases used to average 60 per cent and not less then fifty thousand lives were annually sacrificed to the diphtheria scourge, the mortality has been reduced to less than one fourth, and a still further reduction is anticipated when the country physicians use it more freely. A serious epidemic of diphtheria at Trieste is reported to have been practically stamped out by its use.

In Paris, as stated on the authority of Dr. Roux, the use of antitoxin has reduced the diphtheritic death-rate from 50 per cent of cases attacked to 14 per cent.

That it has been found equally efficacious in the treatment of membranous croup justifies THE SANITARIAN'S practice for many years in grouping the mortality from croup and diphtheria under one head, as from one and the same disease. But like all other potent medicines, the use of antitoxin serum is not wholly devoid of danger. It should be of *certain* strength and the dose carefully measured. At a medical meeting in Vienna a few days ago (London correspondent, February 10th), Professor Drasche's criticism was unfavorable to the new method, the effects of which he had observed in thirty cases. He found that injections of the Behring antitoxin serum affected the kidneys seriously. This observation was corroborated by other doctors.

But up to the present, he said, the time for observation had been much too short to permit a final decision on the value of the treatment. Even now, however, it was clear that its application should be limited. With regard to statistics which are supposed to prove its success, Professor Drasche said that in diphtheria bare figures were no evidence; nor, we may be permitted to add, kidney complications in grave cases of diphtheria apart from the antitoxin treatment. Few practitioners who have seen much of the disease have failed to encounter such complications, no matter what the treatment. The danger of too many sources of supply, business rivalry, incompetency of chemical knowledge, and consequent uncertainty of

quality, and too little attention to preventive measures against the disease, are all-important drawbacks to be considered.

EXPRESSMEN AND SMALL-POX—A JUDICIAL DECISION.—In June last (Vol. XXXII., p. 556) we had occasion to animadvert upon Judge Gaynor's decision against the right of the Health Department of Brooklyn to quarantine expressmen who refused to be vaccinated, and who persisted in transferring packages and freely circulating among people in districts infected with small-pox. One of the results of Judge Gaynor's decision in the case was the institution of damage suits against Health Commissioner Emery for sums aggregating $110,000, and another result was the hampering of the Health Department in the performance of its duty.

The General Term of the Supreme Court, which was appealed to in the trial of the case, holds that the Health Department had a right to order that these two men be isolated for the protection of the rest of the community. They were imprisoned, it is true; but their imprisonment was by due process of law. The power to isolate people exposed to contagious diseases had been conferred upon the Board of Health by the Legislature. The right of the Legislature to pass such laws had not been disputed, and it had been affirmed by the courts. If the Legislature could confer this power on the Board of Health, then the Board of Health, certainly, could exercise that power. The question of compulsory vaccination was not involved. The Health Commissioner had simply announced that the men would be released from quarantine if they were vaccinated; but unless they were vaccinated they must remain in isolation until all danger had passed. The Health Commissioner had a right to insist. The General Term has decided also that the Board of Education may refuse to allow children to attend the public schools unless they have been vaccinated. Compulsory vaccination is not involved in this decision either. It is admitted by the best physicians that vaccination will prevent small-pox, and it is the duty of all authorities intrusted with the care of the public health to use all possible means to prevent the spread of contagious diseases. In time of epidemics the Board of Health has almost despotic powers over the freedom of individuals exposed to contagion.

It is necessary for the general good that these powers should be exercised.

The effect of this General Term decision will be to relieve Health Commissioner Emery of the necessity of defending the damage suits brought against him, and it will warrant the Commissioner in using his power in the future for the suppression of any epidemic which may appear.

A COMMUNITY WITHOUT VACCINATION.—Dr. Kerr, writing from Rabat, on the westerly shore of Morocco, states some facts that will serve to remind the anti-vaccinationists of England of the condition of their own country before the grand discovery of Jenner. Small-pox makes fearful havoc among the Moors, with whom Dr. Kerr has lived seven years. During an epidemic at Rabat, over one thousand persons died from that disease in the course of two months. Rabat is a town on the Atlantic seaboard of Morocco having a population of 26,000. Of the condition of the town during the epidemic, Dr. Kerr writes the following: "Often we felt it sickening when going through the streets, to see young men and boys sitting at shop doors, flour-mills, etc., covered with small-pox eruption, in every way facilitating the spread of the disease. Every one thinks that it is impossible for him to escape small-pox, hence no precautions are taken. It is painfully sad to see so many people who have lost the sight of one eye, while many are blind altogether. One day not long ago, I paid a passing visit to a *douar*, or collection of tents, outside the city, and it was touching to see the mothers bring their children, asking me to put the medicine in their arms to prevent the infection. I vaccinated all the children in the village, and although they were surrounded by small-pox, none took it."

These conditions, given by Dr. Kerr as to the Africa of to-day, are a simple repetition of what existed in England and Europe before Jenner's great boon to mankind was made possible.—*Journal of the American Medical Association.*

ANTI-VACCINATION FALSEHOODS.—We have received a circular letter of invitation, which is being widely distributed, to a demonstration to be held "under the auspices of the . . .

London Society for the Abolition of Compulsory Vaccination," at Mile End, on September 4th. The following data are given as regards Leicester in respect of the small-pox outbreak of 1892–93 :

	Per million living.
The death-rate from small-pox of the *re*-vaccinated was	270
The death-rate from small-pox of the vaccinated	159
The death-rate from small-pox of the *non*-vaccinated	109 only.

These data are absolutely and scandalously false and misleading. There were no deaths in the period stated among "*re*-vaccinated" persons. We fail to see, therefore, how there can be alleged a death-rate at all, much less 270 deaths per million in "*re*-vaccinated" individuals. The deaths among the "*non*-vaccinated" to give the above rate have been taken *on the whole population over ten years of age*, and those on the "vaccinated" on the *population under ten years of age*. The results are perfectly absurd, and once more wilfully misleading. In regard to the further fabricated falsehoods as to Leicester, as a matter of fact the death-rates per million of the three classes, on the total estimated population of Leicester in 1893, were as follows :

	Per million.
Re-vaccinated	0.0
Vaccinated	5.4
Non-vaccinated	102.7

The circular goes on to show that the infantile death-rate in Mile End in 1893 was below that of London as a whole. What has that to do with the matter at issue? What of Portland Town, Lisson Grove, and Mr. Wynter Blyth's demonstrations of the need and value of vaccination?—*British Medical Journal.*

BACILLI TUBERCULOSIS IN CIGARS.—Dr. Kerez (*Centralblatt für Bacteriologie*) reports the result of experiments which he has been making for the purpose of determining the possi-

bility of the communication of tuberculosis through the medium of cigars. It is a well-known fact that cigar-makers are in the habit of making the leaves adhere to the cigars by moistening them with saliva from their own mouths. The force of habit leads them to continue this practice, although in recent times manufacturers provide their workmen with materials for the purpose indicated. Dr. Kerez made cigars by moistening the leaves with saliva known to contain tubercle bacilli. The cigars were then dried and packed away in boxes in the usual manner. It was found afterward, when the cigars were unrolled and the leaves washed in water, that the infusion thus obtained, having been injected into guinea-pigs, produced tuberculosis, clearly showing that cigars may thus be the means of communicating tubercle bacilli and giving rise to pulmonary disease.—*La Médecine Moderne.*

THE WEATHER AND THE GRIP.—A chart has been prepared by the forecaster of the Weather Bureau in New York, showing the relation between the weather and the grip, from the local deaths reported between March 22d and May 16th, 1891. He reaches the following results: Humidity seems to be the important element in producing or aggravating the disease, for there is a corresponding increase of deaths with increasing humidity; but the fatality is most marked when the humidity is at its maximum and there is a sudden fall of temperature, which is clearly shown on April 21st, when the death-rate was highest, with a record of over 250 in twenty-four hours. The death-rate is also high on the day following a sudden fall in temperature, as shown on April 1st and 30th.

All through the epidemic the chart shows an increasing death-rate with high or increasing humidity. The higher the humidity and the more sudden the fall of temperature the greater the number of deaths. And it is also observed that when the temperature and humidity drop at the same time there is a sudden decrease in the death-rate; this will be seen on March 26th, April 3d, 4th, 5th, and 26th.

It does not follow that excessively cold weather increases the death-rate unless there be a high humidity. On the other hand, it is clearly shown that with cold weather and low humidity the death-rate is greatly reduced.

HEALTH OF THE ARMY.

Report of the Surgeon-General of the Army for the fiscal year ending June 30th, 1894, shows that the "admission rate per thousand of strength present was 1289.04, practically the same as the rate of the previous year, 1270.42, a great improvement on the average annual rate of the previous decade, 1424.20, and only slightly greater than the lowest rate, 1247 (in 1887), ever furnished by our troops. The number of sick daily was 40.15 per thousand of strength, as compared with 39.60 during the preceding year. The number of days lost by sickness was equal to 14.7 for each member of the strength of the army, as compared with 14.5 days during the preceding year and with 15.8 days for the average annual number of the previous decade. The rate of discharge for disability reached its lowest point this year, only 14.93 per thousand of strength, as contrasted with 18.35 during the preceding year and with 28.82 during the years of the previous decade. The lowest rate recorded prior to that of the present year was 17.23 in 1891. This satisfactory result is certainly due to the greater care taken in the selection of men for enlistment, for were it owing to the retention of disabled men, the non-effective rate would give evidence of the fact. The deaths from all causes equalled a rate of 6.91 per thousand living, the lowest rate heretofore recorded having been 6.33 in 1889. Last year the rate was 6.44, and during the years of the previous decade, 8.51. Excluding accidents and injuries the death-rate was 4.01, which is practically the same as that of the year 1889, the year of least mortality, when the death-rate from disease was 3.95 per thousand living. . . .

Injuries, as usual, take first place in the causation of the admissions to sick report, having caused 243.29 of the 1289.04 admissions per thousand of strength during the year. Specific febrile diseases take second place, with a rate of 171.19, mostly due to influenza; diseases of the respiratory and the digestive system take third and fourth place, respectively, with 141.06 and 113.77 cases per thousand men; diarrhœal diseases stand fifth, with a rate of 98.47, and malarial affections sixth, with 93.64.

Injuries caused also 7.92 of the 40.15 constantly disabled

in every thousand men. Venereal diseases, as in former years, take second place as a disabling cause, having kept 5.41 men unfit for duty out of every thousand. Third place was taken by specific febrile diseases, 4.50, the chief factors being influenza and typhoid-fever from the number and duration, respectively, of their cases. Then follow in order of prominence diseases of the respiratory system, 3.45 ; malarial diseases, 2.45 ; diseases of the digestive system, 2.09, and of the locomotor system, 2.02, the last mostly cases of muscular rheumatism.

The absolute number of discharges for disability was 413. Seventy-one of these were occasioned by accidents and injuries, including 21 cases of rupture ; 53 by venereal diseases ; 48 by insanity, epilepsy, and other affections of the nervous system ; 44 by pulmonary consumption ; 36 by diseases of the locomotor system ; 32 by heart disease, and 24 by affections of the eyes.

The absolute number of deaths was 191. Eighty of these were deaths from violence or accident, including 25 from gunshot wounds and 21 by drowning. Pneumonia caused 18 ; pulmonary consumption, 17 ; typhoid-fever, 16 ; kidney disease, 11 ; alcoholism, 10 ; heart disease, 6, and erysipelas, 5.

The mean strength of the Army during the year was, according to the medical reports, 25,287 men : Whites, 22,429 ; negroes, 2143, and Indians, 715. Both the admission rate and the rate of non-efficiency of the white troops were larger than the corresponding rates of other races, but the death-rate of the negroes and the death and discharge rates of the Indians were considerably higher than those of the white troops.

The Indians appear to have suffered more than the whites from mumps, erysipelas, venereal diseases, conjunctivitis, and other diseases of the eye, consumption, pneumonia and glandular swellings ; less than the whites from muscular rheumatism and hernia. The negroes suffered more than the whites from mumps, erysipelas, muscular rheumatism, and frostbite ; less than the whites from venereal diseases. The whites suffered more than the other races from malarial and diarrhœal diseases and alcoholism. The high death-rate of the Indian was due to consumption and pneumonia, and his

high rate of discharge to the effects of these diseases and of syphilis.

Health of the Military Departments.—The admission rates of the military departments varied from 1578.77 per thousand of strength in the Department of Texas to 788.71 in the Department of the Columbia. The departmental rate of non-efficiency had its maximum and minimum, 53.97 and 24.68, in these same departments. In the departments of the East and of the Missouri both of these rates were higher than the average of the army, while in all the other departments they were lower than the average.

The death-rate also had its maximum and minimum in Texas and the Columbia, ranging from 11.54 to 5.79 per thousand living. It was lower than the average of the army only in the departments of the Columbia, Colorado, and Missouri.

The rate of discharge for disability ranged from 20.14 per thousand of strength in the Department of California, to 8.63 in the Department of the Platte. It was below the army average only in the departments of the Platte, the East, and the Columbia.

Last year, as during that which preceded it, the Department of Texas had the worst and the Department of the Columbia the best medical record.

Specific Febrile and Acute Infectious Diseases.—The statistics of these diseases, including erysipelas, tonsilitis, and cases reported as typho-malarial-fever, for the past year do not differ materially from those for the year preceding it. The admission rate was 171.19, of which 81.15 was credited to influenza, 49.91 to tonsilitis, and the remainder chiefly to mumps, measles, dengue, diphtheria, and enteric-fever, the whole giving a constant sickness of 4.50, of which 1.34 was occasioned by influenza and 1.19 by enteric-fever. The death-rate was 1.01, of which .62 represents the fatal cases of the last-named disease.

Medical Officers.—During the fiscal year ending June 30th, 1894, the Medical Department of the army lost 11 of its members, 1 by death, an assistant surgeon-general with the rank of colonel, and 10 by retirement.

At the close of the year there were ten vacancies, and a board had been convened to select the individuals to fill these

vacancies; but inasmuch as the Military Committee of the House of Representatives, in draughting the army appropriation bill for the current year, seemed to regard a reduction of the numerical strength of the Medical Corps as desirable, the order convening the board was at my request rescinded, and the candidates who had been invited to appear for examination were notified of the indefinite postponement of the examinations. The bill when passed directed that the number of assistant surgeons be reduced to 110, a loss to the corps of 15 young officers instead of 35, as originally proposed.

The Surgeon-General comments at some length on this action, and shows that the reason assigned for it by the Committee on Military Affairs were founded on a misapprehension of the facts.

"When this department was reorganized by law in 1869," the Committee reports, "there were 210 military posts and stations in the country. This number has already been greatly reduced, so that there are now but 120 military posts and stations, and a still further reduction is proposed and will be effected within a few years. It is evident that if 193 officers in this department were sufficient when the number of posts and stations was 210, there can be as great a reduction as is proposed in this bill when the number of posts and stations is reduced to 120."

On page 4 of the report of the Committee it is stated that "it may be necessary in several instances to employ outside attendance of physicians for the smaller posts, but that can always be done and efficient services secured at the cost of from one fifth to one fourth of the present average of salaries of the officers of the corps." By which it is evident that the Military Committee's estimate of the duty of the army surgeon is, that it is mere attendance of the sick and wounded. For, as a matter of fact, the Surgeon-General states there were 184 acting assistant surgeons in service in 1870, after the reorganization referred to, and these acting assistant surgeons performed all the duties of junior medical officers. They were made responsible for medical property, and were ordered wherever their services were required, in the field with troops, as assistants at large posts, and as post surgeons at small posts. As the number of posts was reduced and the exigen-

cies of the service permitted, their number was reduced as follows: In 1875 to 150, in 1880 to 111, in 1885 to 58, in 1890 to 48, in 1892 to 22.

Besides, private physicians have been employed during the past year and are now employed at all the arsenals of the country. The number of men at these stations is comparatively small, and a saving is made by paying for medical services by the visit. But it is a mistake to suppose that private physicians could be employed at garrisoned posts, whether large or small, at the low estimate cited above. Indeed, it is questionable if there are more than half a dozen posts in the country where satisfactory medical attendance could be provided at less cost than the pay of an assistant surgeon of the Army, $133.33 per month. Moreover, a post medical officer has various and important duties to perform in addition to caring for the sick. In fact, his presence as a member of the garrison is more important than that of any other officer, for no other officer can perform his duties, whereas any line officer present can perform the duties of quartermaster, commissary of subsistence, adjutant or commanding officer, of a company or garrison.

Again, an important part of the duty of a medical officer in a garrison is to decide whether enlisted men who report themselves sick are in reality unfit to perform their duties, or whether they feign sickness for the purpose of avoiding these duties. A private physician called in by the visit is not present at sick call to determine this question, and when it is left to the decision of a non-professional person a company officer—or non-commissioned officer, for instance—the man who feigns sickness has a better chance of success, and the really sick man is often compelled to do duty because he is suspected of malingering.

The Major-General commanding, on page 12 of the Committee's report, is cited as saying: "At military posts it is, in my judgment, impracticable to supply the necessary service, including that in the hospitals, in any other way than through the regular commissioned officer."

Much other evidence of the same purport is cited by the Surgeon-General, showing that the importance and the amount of service required of the army surgeon are much greater than

what appears to have been contemplated by Congress at the time of making this reduction, or by other persons unacquainted with the service suppose.

Again, in expressing his regret at the policy which has cut off 15 officers from the Department, the Surgeon-General would have it remembered that medical officers are as liable as other officers to break down under the exposures and accidents of field service or from other causes. During the past three years a little over 5 per cent of them have been constantly non-effective from sickness, or 10 officers of the 192 allowed by law up to the time of the passage of the current appropriation bill.

Moreover, these officers are as much entitled as other officers to leaves of absence; but inasmuch as the Regulations of the Army prescribe that leaves will not be granted "so that a post will be left without competent medical attendance," many of the officers of the Medical Corps have to do, year after year, without leaves such as are enjoyed by others. During the past ten years the leaves of absence granted to medical officers were equivalent to an average leave annually of a little less than 14 days for each. To enable the Department to permit its officers to have one month's leave annually, and at the same time provide competent medical attendance at posts, a strength of 8.3 per cent is needful over and above that necessary to man the posts.

HEALTH OF THE NAVY.

Report of the Surgeon-General of the Navy for the year ending June 30th, 1894.

Mean strength of the Navy and Marine Corps, including officers and men for the year 1893:

Officers of the Navy and Marine Corps on the active list, 1543; enlisted men, including apprentices, 8554; enlisted men of the Marine Corps, 2012: 12,109.

Mean strength of the Navy and Marine Corps, including officers and men, of the force afloat, 10,193.

Total number of patients under treatment during the year 1893:

Naval hospitals, 1595; navy yards and stations, 2106; vessels afloat and receiving ships, 8371: 12,072.

Total number of days the sick were under treatment during the year 1893 :

Naval hospital, 75,668 ; navy yards and shore stations, 12,385 ; vessels afloat and receiving ships, 58,893 : 146,946.

Total number of deaths from all causes during the year 1893 :

Naval hospitals, 36 ; navy yards and stations, 14 ; vessels afloat and receiving ships, 39 : 89.

Ratio per thousand of deaths in the Navy and Marine Corps for the year 1893, 7.34.

Ratio per thousand for the force afloat, 3.82.

Summary—force afloat: Daily average number of sick, 161.35 ; average number of days each case was under treatment, 6.10 ; admission per thousand of mean strength, 821.24 ; invaliding per thousand of mean strength, 80.93 ; deaths per thousand of mean strength, 3.82.

Insane.—Government Hospital for the Insane, Washington, D. C. Number remaining in hospital, June 30th, 1893, 72 ; admitted to hospital to June 30th, 1894, 23 : 95. Discharged from hospital to June 30th, 1894, recovered, 5 ; improved, 2 ; died, 10 : 17. Remaining in hospital, June 30th, 1894 : Officers, 8 ; enlisted men and marines, 70 : 78.

The Naval Hospitals are, for the most part, in good condition, some of them having been extensively improved during the year. But in a few others there still remain important defects.

Of the hospital at Portsmouth, N. H., Surgeon J. G. Ayers, in charge, reports the inconvenience of using the small dead-house for tools and storage of oils and many other things, for which there is little room, and urges the building of a small tool-house at the earliest practicable time. And that should a case of small-pox occur at this station there is no building unoccupied which could be used for isolation and treatment, nor is there an hospital in this region to which the patient would be admitted. A small building should be erected and equipped for such cases at the earliest practicable time.

For the Naval Hospital at Chelsea, Mass., Medical Director Cleborne recommends the erection of a disinfecting chamber in connection with the steam-heating boilers ; and that it should be made large enough to disinfect patients' clothing,

bed linen, and bedding, and could also be used to effectually destroy insect life in ward bedsteads and wire mattresses.

Much complaint is made of the Mystic water. The supply is ample for all purposes, but it is full of organic matter, and so muddy, especially when the mains are under repair, that faucet filters had to be purchased and used to get water clear enough for cooking, toilet, and laundry purposes.

On the Philadelphia Naval Hospital, Medical Director Kindleberger reports that, although a great deal has been done externally and internally toward the preservation of the building, the plumbing system needs complete renovation to put it in a perfect sanitary condition. A Government hospital should represent the latest improvements known in sanitary science, whereas this one still has, in part, the original system put in when the building was constructed.

Surgeon Franklin Rogers, in connection with his report on the Naval Hospital at Yokohama, Japan, takes occasion to submit the following abstract of the

Vital Statistics of China. They pertain to the empire for the year 1892 :

Total population, 41,089,940, of which 20,752,366 are males ; 20,337,574 females. Increase over previous year, 371,263. Births, 1,207,034 ; deaths, 886,988, of which 328,872 were in children under ten years of age. Marriages, 348,489 ; divorces, 113,498. In prisons, 106,313 persons. The males exceed the females by 414,792.

The population of Yokohama at the end of 1892 was 143,252, an increase of 22,544 over the preceding year. The foreign element numbers 4928, of which 270 are Americans. The proportion of males to females is 3 to 1 among foreigners.

The following items were furnished me by the local authorities, and pertain to the year 1892. The number of cases of dysentery, etc., are not reliable for reasons that they understate the facts. Diseases :

Cholera, 11,919 cases, 8875 deaths.
Typhus exanthem, 38,759 cases, 8888 deaths.
Typhus abdominalis, 631 cases, 125 deaths.
Dysentery, 41,904 cases, 9861 deaths.
Small-pox, 8612 cases, 2067 deaths.
Diphtheria, 3097 cases, 1778 deaths.

Sick Quarters on Board Vessels of War.—Under this head the Surgeon-General refers to a special report relating to the importance of providing suitable accommodations on board of our ships for the care and treatment of the sick and wounded of the Navy that has already been submitted to the Department. The plans of all vessels in commission undergoing construction and nearing completion have been carefully examined with a view of selecting suitable locations for sick quarters, and recommendations made when required. On board of ten vessels no quarters are designated for the treatment of the sick and wounded; in the case of the *Minneapolis* the omission was probably due to an oversight, as this vessel was designed on similar lines to her sister ship, the *Columbia.*

Subsequent to the examination of the plans of our uncompleted warships, the drawings of the armored cruiser *Brooklyn* and the battleship *Iowa* were submitted to the Bureau, and, in consultation with the President of the Board of Inspection and Survey and the Bureau of Construction and Repair, suitable sick quarters were located.

It is earnestly suggested that hereafter before sick quarters are assigned on our ships this Bureau may be consulted as to their location.

The medical officer assigned by the Department as a member of the Board of Inspection and Survey has been instructed to pay special attention to the subject of sick quarters, sanitation, and general ventilation of all vessels inspected.

Reports on Cruising Ships.—Most of these forcibly demonstrate the need of the foregoing urgency by the Surgeon-General.

On the *San Francisco*, Medical Inspector Van Reypen reports that the presence of the ship in the West Indies during hot weather has demonstrated the almost absolute inefficiency of the system of artificial ventilation. The fire-rooms, engine-rooms, dynamo-rooms, steam-steering-room, and after store-rooms have been insufferably hot. The hollow mizzen mast was intended to be the outlet for the hot air from the dynamo and steam-steering rooms, but its interior is so filled with braces and the aperture is so small at the top that very little air can be forced through it. If a door was cut in the mast just above the poop it would afford an exit to the hot

air from below, and be of incalculable benefit. The port blower, which is supposed to furnish artificial ventilation to the after part of the ship when running at its highest attainable speed, sends only a very feeble current of air through the ventilating pipes. The vessel is provided with battle doors in the protective deck, which are supposed to be closed in action. The theory is excellent, but practically not one of them could be closed without suffocating all the men below them.

On the *New York*, Medical Inspector Kershner reports for a period of only five months, beginning August 1st, 1893: The large amount of coal burned fills the ship with heat, and in a warm climate renders life on board very uncomfortable; but when steaming the ship is very hot, especially in all those parts which are below the gun-deck. The berth deck is always too warm, caused by the heat escaping from the dynamo-room, which has no outlet for the hot and vitiated air, except through the hatch to the berth-deck. The dynamos should be placed in the engine-room or be supplied with a hot-air shaft of its own to carry out the foul air.

When steaming the temperature of the berth-deck reaches at times 92°, and it is impossible for the men to get refreshing sleep there. The greater part of the ward-room is directly over the engine-rooms, consequently many of the officers' state-rooms are overheated from the heat below.

The only access to the engine-room is through the ward-room, as the engine-room door opens into the ward-room, permitting the escape of heat into it; it also causes the ward-room to serve as a highway to the engine-room.

It is therefore impossible to keep it free from the coal and oil tracks of the men.

The junior officers' quarters are situated abaft the ward-room; thus the ward-room also serves as a highway for the junior officers and their servants. It is a most faulty arrangement. . . .

A large portion of the berth-deck is taken up by the fire-room, bulkhead inclosures, and uptake. These make it very hot.

The berth-deck contains 41,644 cubic feet of air-space, and has hammock hooks to berth 156 men, giving 266 cubic feet of air-space for each man. The steam blowers and the ice

machine are on the berth-deck, and produce great heat around them. They, as well as the dynamo-room, should be in the engine part of the ship, where all this waste heat could go out through the smoke-pipe.

On the starboard side are the quarters for the machinists. They are too small, only 52 cubic feet of air being allowed for each. They are in the hottest and poorest ventilated part of the ship. They cannot live in health there any length of time. A larger space should be given them in a better part of the ship.

The sick bay is in the same part of the ship that it has been for ages past, in the bow, on the berth-deck, having only a torpedo operating-room forward of it. It is 10 feet wide forward and 20 feet aft, with a length of 18 feet, containing only about 1900 cubic feet of air. It is ventilated by six air ports and one hatch; all of these have to be closed at sea. There are two ventilator inlets, but they are so far from the blowers that there is no perceptible movement of air through them. There is room to swing two cots. The forward torpedo is operated through the sick bay, while the blacksmith forge is overhead. The noise of the huge cables running through the steel pipes that pass through the sick bay is deafening, causing the patients to hold their heads in agony. The vibrations dash the electric-light fixtures to the deck below.

There are leaks through the sides of the ship into the torpedo-room, and the only outlet for the water is through the sick bay or into the medical store-room below the torpedo-room. So far it has been impossible to stop the leak. While in New York the temperature of the store-room was cold enough to freeze liquid; now it is 81°.

The vertical and lateral motion of the bay, combined with the vibration when the ship is under way, are so great as to make it useless for the purposes for which it was intended.

It is impossible to do accurate work there, such as is required for any surgical procedure, and I strongly urge its abandonment for some place in the body of the ship. The bow can never be successfully used in any fast ship for such delicate purposes, and when quiet and rest are required for the establishment of health. The operating-room, so called, is the bath-room and water-closet. Comment is unnecessary.

For the comfort and welfare of the sick and wounded, as well as for the credit of the Medical Department of the Navy, I respectfully ask that these defects be remedied. . . .

The absence of any provision for the wounded in battle fills one with amazement. There is no place below the protective deck where surgical operations can be performed. This defect exists in all of our new ships, I believe. If there was a place to operate, a wounded man could not be carried there, as no hatches exist large enough to lower him through.

Should a man be injured in the engine-room, or be overcome by heat, it would be almost impossible to remove him to the deck on account of the narrow, tortuous steps, while the only exit from the fire-rooms is up the vertical ladders, and the openings are only large enough for a man to crawl through. It will be seen that the removal of a disabled man through such a place without acute torture would be impossible. . . .

On the *Baltimore*, Medical Inspector J. M. Flint reports that the sick bay is well lighted, fairly well ventilated in port, but very hot and close at sea, and is difficult of access for the patients, who have to pass through the engine-room, machine-shop, coal bunker, and after orlop to reach it. The seriously sick or injured are with difficulty taken through the small after hatches leading from the spar-deck through the lower cabin passage to the orlop.

On the *Detroit*, Surgeon Hibbett reports for a period less than six months. The ship has no sick bay. This is a most deplorable fact to contemplate on board of any seagoing ship ; bad enough where the berthing spaces are sufficiently large and well ventilated to give fair comfort to men in good health, and where the sick may be isolated by temporarily depriving others of their regular berths, but in a ship of this class, where every dry, ventilated, and not overheated space is crowded beyond its healthful capacity, the absence of a proper place for the treatment and care of the sick is not only a source of annoyance and discomfort to others, but is fraught with no little danger to the unfortunate sailor. Only the man who is sick and the officers who are responsible for his condition can appreciate the facts as above stated. It is unfortunately true that the conditions for both the prevention and

treatment of disease on board this ship are most unfavorable, and in these respects she is illy adapted to her work as a cruiser. Surely highest efficiency cannot be obtained with men subjected to such discomforts as are necessarily imposed upon the crew of this ship.

Statement of sick: Average number of persons on board, 237; number of days in commission, 165; number of admissions to the sick list, 103; number of sick days, third quarter, 153; fourth quarter, 462; total, 615; average number of daily sick, 3.72; percentage of sick to force on board, per day, 1.56. Cases attributable to causes existing prior to enlistment, 1; climatic influences, 25; local influences on board ship, 33; injuries, 15; venereal, 10; other causes, 19.

It will be observed that about 33 per cent of the cases are here attributed to local causes on board ship. The only ship with which I am able to make comparison on this point is the *Alert* for 1892, where the percentage of sick due to local influences on board was about 21.

The Medical Corps.—During the year 30 permits were issued to candidates to appear before the medical examining boards. Of this number, 10 failed to present themselves for examination, and of the rest, three only were found qualified for admission as assistant surgeons into the Medical Corps of the Navy. There are still eight vacancies. This record, showing a rejection of 85 per cent of candidates examined, the Surgeon-General truly says, "is not satisfactory, particularly when we contrast the large number of properly qualified applicants for similar positions in the Army and Marine Hospital Services, and the promptness with which such vacancies are filled."

The reason is by no means hard to account for. The examination for admission is no more rigid than is that for admission into the Medical Corps of the Army. But the status is far different. The Assistant Surgeon, on entering the Medical Corps of the Army, is at once given rank and mess privileges with officers of his own age and culture; but in the naval service the Assistant Surgeon is on board ship, ranked, and made to mess with ensigns fresh from the naval academy, and on all occasions of display abroad even made subordinate to them. Under such circumstances the surprise is, not that

15 per cent only of those who seek the office are found qualified, but that any at all are.

The Surgeon-General very justly concludes that this state of affairs "can only be accounted for from lack of suitable inducements to the class of men who would tend to advance the standard of professional excellence, or from whom a greater knowledge of medical skill and military efficiency might be expected."

MORTALITY AND MORBILITY REPORTS.

ALABAMA.—Jerome Cochrane, M.D., State Health Officer, Montgomery.

Mobile, 31,076: T. S. Scales, M.D., Health Officer, reports for the month of December a mortality of 71, of which 29 were colored, and 17 were under five years of age. The annual death-rate per 1000 was 27.36.

Zymotic diseases caused 8 deaths, and consumption, 9.

ARKANSAS.—John I. Hancock, M.D., President, Argentina; D. W. Holman, Secretary, Little Rock.

CALIFORNIA.—C. W. Nutting, M.D., President, Etna Mills; J. R. Laine, M.D., Secretary, Sacramento.

For the month of December the reports from 77 cities, towns, villages, and sanitary districts, aggregating a population of 791,223, show a mortality of 1061—a death-rate of 16.08 per 1000 per annum.

There were 180 deaths from consumption, 156 from acute diseases of the lungs, 17 from diarrhœal diseases, and 67 from other diseases of the stomach and bowels, 29 from diphtheria and croup, 2 from whooping-cough, 36 from typhoid-fever, 5 from cerebro-spinal-fever, 39 from cancer, and 70 from heart disease.

Reports of prevailing diseases from 44 localities, outside of the larger towns and cities, give 355 cases of acute diseases of the lungs, 151 of diarrhœal diseases, 44 of diphtheria and croup, 26 of measles, 198 of *la grippe*, 61 of typhoid-fever, 285

of malarial fevers, 6 of cerebro-spinal-fever, 141 of tonsilitis, and 72 of pharyngitis.

COLORADO.—A. Stedman, M.D., President, Denver; Henry Sewell, M.D., Secretary, Denver.

CONNECTICUT.—Professor William H. Brewer, Ph.D., New Haven, President; Professor C. A. Lindsley, M.D., Secretary, New Haven.

The mortality report for December has been received from 163 towns in the State. There were 1054 deaths reported in the State during the month. This was 101 more than in November, and 264 less than in December, 1893, and 154 less than the average number of deaths in December for the five years preceding the present. The death-rate was 15.8 for the large towns, 14.7 for the small towns, and 15.5 for the State. The deaths from zymotic diseases were 144, being 13.6 per cent of the total mortality. There were 125 deaths from consumption.

Norwalk, January 24th.—The Board of Health has condemned 8 of the 11 public school buildings as unfit for use.

New Haven, February 11th.—President Dwight, of Yale University, is a good deal exercised over the alleged neglect of the city authorities in permitting bad drainage and other public nuisances dangerous to the health of the students to exist. The city authorities maintain they have done all in their power to protect the sanitary condition of the town.

DELAWARE.—E. W. Cooper, M.D., President, Camden; E. B. Frazer, Secretary, Wilmington.

Sussex County, 38,000: Report of deaths for the quarter ending December 31st, 1894: Total, 118—white, 110; negroes, 8. The prevailing causes of death were: Typhoid-fever, 6; pneumonia, 9; heart disease, 11; consumption, 25.

DISTRICT OF COLUMBIA, 250,000: W. C. Woodward, M.D., Health Officer.

Mortality report for the three weeks ending January 26th, 304, of which number 116 were of colored people, and 89 were under five years of age. The annual death-rate was 17.8 per

1000. There were 24 deaths from zymotic diseases, and 35 from consumption.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M.D., Secretary, Jacksonville.

The summary, as published in *Florida Health Notes* for the month of November, is as follows:

Number of counties reporting, 45; number of cities reporting, 3; total population of said counties and cities, 391,422; number of deaths reported, 304; death-rate per 1000 per annum, 9.31; number of deaths under five years of age, 80.

ILLINOIS.—William E. Quine, M.D., President, Chicago; J. W. Scott, Secretary, Springfield.

Chicago, 1,600,000: A. R. Reynolds, M.D., Commissioner.

The mortality for December was 1781, of which number 702 were under five years of age. The annual death-rate per 1000 was 13.36. There were 471 deaths from zymotic diseases, and 171 from consumption. Typhoid-fever caused 34 deaths; diphtheria and croup, 237; scarlatina, 15, and small-pox, 42.

January 17th.—The Health Commissioner has found cause to urge more attention by the Board of Education to the ordinances governing vaccination. He asks the Board to instruct the principals of schools to examine all of the children in order to determine the exact status of the vaccinal protection. He said children might be readmitted to school pending the development of the vaccinal process on certificates furnished by the members of his force.

Small-pox, at latest report (Tuesday, February 5th).—Cases received, 0; discharged, 5; deaths, 1; remaining in hospital, 115. Wednesday: Received, 2; discharged, 7; deaths, 1; remaining in hospital, 109.

The Department has a large number of men out vaccinating and disinfecting.

INDIANA.—S. S. Boots, M.D., President, Greenfield; C. N. Metcalf, M.D., Secretary, Indianapolis.

Crawfordsville, January 21st.—There have been 10 deaths from diphtheria at *Waynetown*, a town 10 miles west of here.

IOWA.—Frederick Becker, M.D., President, Claremont; J. F. Kennedy, M.D., Secretary, Des Moines.

From the State Board *Bulletin* for January:

Boone, 10,000, reports for December: Deaths, 13—5 from diphtheria.

Cedar Rapids, 25,000, reports for December: Deaths, 16.

Clinton, 22,000, reports for December: Deaths, 14.

Creston, 10,000, reports for November: Deaths, 7—2 from typhoid-fever.

Davenport, 35,500, reports for November: Deaths, 44; diphtheria, 5; typhoid-fever, 2. For December: Deaths, 10; typhoid-fever, 2.

Des Moines, 82,000, reports for November: Deaths, 75; diphtheria, 4; typhoid-fever, 3; consumption, 13. For December: Deaths, 47; diphtheria, 7; typhoid-fever, 3; consumption, 4.

Keokuk, 18,000, reports for November: Deaths, 18; typhoid-fever, 1.

Oskaloosa, 8000, reports for December: Deaths, 4; typhoid-fever, 1.

Ottumwa, 17,000, reports for December: Deaths, 26; diphtheria, 5; typhoid-fever, 1.

Dubuque, 40,000, reports for December: Deaths, 24; diphtheria, 2; typhoid-fever, 1; pneumonia, 6; consumption, 4.

KANSAS.—J. P. Stewart, M.D., President, Clay Centre; H. A. Dykes, M.D., Secretary, Topeka.

KENTUCKY.—Joseph M. Matthews, M.D., President, Louisville; J. N. McCormack, M.D., Secretary, Bowling Green.

LOUISIANA.—S. R. Oliphant, President, New Orleans; W. R. Harnan, M.D., Secretary, New Orleans.

New Orleans, 254,000—184,500 white, 69,500 colored. There were reported for four weeks ending January 26th, 710 deaths, of which number 255 were among the colored people, and 213 of children under five years of age. Annual death-rate per 1000, 34.51. Zymotic diseases caused 123 deaths, and consumption, 71.

For the year 1894 the death-rate was, of the whites, 21.91;

including the colored, 24.88 per 1000, against a rate of 27.42 per 1000 for the previous ten years and 27.37 for the previous ten. If New Orleans can but keep up this improvement, it will have nothing to complain of. The most important items in this connection are good drainage and sewerage, which it has been just about to accomplish for fifteen years, waiting to get richer at the risk of an epidemic that would cost more than a hundredfold the improvements continually under contemplation.

MAINE.—C. D. Smith, M.D., President, Portland; A. G. Young, M.D., Secretary, Augusta.

MASSACHUSETTS.—H. P. Walcott, M.D., Chairman, Cambridge; S. W. Abbott, M.D., Secretary, Boston.

Twenty-third Annual Report of the State Board for the year ending September 30th, 1893.

Infectious Diseases.—Small-pox, 44 cases, 6 deaths. During nine years (1885–93) there were 168 cases and 34 deaths, or 20 per cent of the whole. Of this number 61 were vaccinated, and of these 3, or only 4.9 per cent, died. Of the unvaccinated there were 76, and of these 23, or 30.3 per cent, died.

Diphtheria and croup reported during the year 2919 cases, 926 deaths; scarlet-fever, 7420 cases, 654 deaths; typhoid-fever, 2457 cases, 492 deaths; measles, 6290 cases, 98 deaths. In the aggregate these diseases were considerably more prevalent than during the preceding year.

From consumption the number of deaths reported was 5739—255 more than in 1891, and 49 less than in 1890. The death-rate per 10,000 of the estimated population from this cause was 24.2, and the percentage of the total mortality, 11.77. Deaths from pneumonia, 5020—682 more than in previous year; 10.29 per cent of the total mortality.

For every 1000 deaths from all causes in the *urban* population, there were 879 deaths in the remainder of the State in equal numbers living. For every 1000 deaths from *consumption* in the *urban* population there were 794 deaths in the remainder of the State in equal numbers living.

Water Supply and Sewerage.—For report upon this subject, in part, the reader is referred to the paper on "Sand Filtra-

tion of Water," by George W. Fuller, biologist of the Board, in our January number. The report upon the " Amount of and Character of Organic Matter in Soils and its Bearing on the Storage of Water in Reservoirs," by Thomas M. Drown, M.D., chemist of the Board, is a paper of great practical utility wherever artificial storage basins are constructed by impounding water in valleys having a surface either partially or wholly of loam or peat. Hiram F. Mills, C.E., member of the Board, gives a description of the " Filter of the Water Supply of the City of Lawrence and its Results," showing the insufficiency of the self-purification of streams, the ready conveyance of typhoid-fever down a stream by sewage-polluted water, and the practicability of protecting a community against an infective drinking water supply by natural filtration. " Sewage Purification of Cities and Towns in Massachusetts" is a concise description of the systems in use, and " Chemical Analyses of the Sewage and Effluents of (a dozen small) Towns," is also a paper of much practical utility.

Mr. Allen Hazen, the chemist in charge of the Lawrence Experiment Station in 1890–93, gives a description of the process of sewage disposal by precipitation, and the results at the World's Columbian Exposition at Chicago.

Food and Drug Inspection has been pursued during the year as usual—6409 samples were examined—a greater number than during any previous year ; 3073 were of milk ; 49.7 per cent showed adulteration or deficiency. Of 3009 samples of other kinds of food examined, 12.3 per cent were found to be adulterated. Of drugs—327 samples examined—the percentage of adulteration was 30.3.

" *Isolation Hospitals for Infectious Diseases*," by the Secretary of the Board, is a paper of much practical value to health authorities. It not only shows the importance of the subject, but the best plans for the construction of such hospitals.

Boston, 501,107 : S. H. Durgin, M.D., Chairman, reports for the month of December 952 deaths, of which number 304 were under five years of age.

The annual death-rate was 22.79 per 1000. From zymotic, including tubercular (147) diseases there were 324 deaths, of which 99 were due to diphtheria, 11 to typhoid-fever, 17 to scarlatina, 11 to whooping-cough. Of these diseases there

were reported during the month: Diphtheria, 469; typhoid-fever, 42; scarlatina, 278; measles, 210.

Worcester, January 29th.—Thirty-three cases of *diphtheria* reported thus far during the month. Within forty-eight hours last week there were 5 deaths from diphtheria, covering the 22d to the 24th of the month, and all were practically in the same neighborhood.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M.D., Secretary, Lansing.

Twenty-sixth Annual Report Relating to the Registry and Return of Births, Marriages and Deaths in Michigan for the Year 1892, by the Secretary of the Board.

The Secretary of State, in his letter of transmittal of the report to the Governor, states that "the returns of both births and deaths are deficient to such a degree that they would require to be increased by at least 60 per cent to correctly represent the actual numbers of births and deaths that occurred." Secretary Baker remarks that, owing to the imperfect method of collecting the data, by supervisors and assessors, not more than 60 per cent are reported. He urges such legislation as would place the sanitary service of the State in this regard on the same footing as that which obtains in the New England States, New York, and New Jersey.

The summary of the returns made is as follows:

Marriages returned	20,107
Persons married per 1000 estimated population (2,185,279)	18.4
Births reported	46,221
Births per 1000 estimated population	21.2
Deaths reported (exclusive of still-births)	21,729
Deaths per 1000 estimated population	9.9
Natural increase of population	24,492
Natural increase per 1000 estimated population	11.3

Of the 21,729 deaths from all causes, 5369 were caused by *zymotic* diseases, of which there were, from diphtheria and croup, 1311; typhoid-fever, 626; scarlet-fever, 442; whooping-cough, 147; measles, 72.

Consumption killed 2080—11.8 per cent of the total mortality. The distribution of the deaths reported from this disease, and of the deaths from diphtheria, is shown by parti-colored maps. And numerous diagrams illustrate the greater or less prevalence of zymotic diseases in different seasons, as well as their distribution in the State.

Altogether, the volume, although almost wholly statistical and confessedly incomplete, is a valuable contribution to the study of vital statistics.

At the quarterly meeting of the Board, January 11th, the following resolution, offered by the Secretary, was adopted, and a committee appointed to urge it before the Legislature :

Resolved, That the Michigan State Board of Health earnestly recommends the enactment of an improved law for the registration and return of deaths (and also of births), which law shall provide for their immediate record and prompt report to the State Department.

Dr. Milner, of Grand Rapids, Committee on Schools, was directed to prepare a bill for introduction in the Legislature which shall regulate the employment of teachers in our public schools, and professional nurses who are affected with any communicable form of tuberculosis. Instances have been noted and referred to by Dr. Milner at a previous meeting, where it is probable that tuberculosis (consumption) has been contracted from a teacher.

The Secretary reports that for the month of January, 1895, compared with the preceding month, the prevailing direction of the wind was the same (southwest), the velocity was 0.6 of a mile per hour greater, the temperature was 12.67° lower, the rainfall at Lansing was 1.52 inches more, the absolute humidity was much less, the relative humidity was slightly more, the day ozone was much more, the night ozone was the same, and the depth of water in the well at Lansing was three inches less.

For the month of January, 1895, compared with the preceding month, pleuritis, influenza, and pneumonia increased, and erysipelas, diphtheria, and remittent-fever decreased in area of prevalence.

Including reports by regular observers and others, consumption was reported present in Michigan in the month of Janu-

ary, 1895, at two hundred and twenty-seven places; scarlet-fever at one hundred and thirty-six places; diphtheria at eighty-four places; typhoid-fever at sixty-nine places; measles at twenty-five places, and small-pox at fourteen places.

Reports from all places show scarlet-fever reported at nine places more; typhoid-fever at five places less; diphtheria at one place more; measles at thirteen places more, and small-pox at four places more than in the preceding month.

Detroit.—Contending against each other, instead of against diphtheria and small-pox, continues to be the substance of energetic effort by the civil authorities and the physicians of Detroit. The latest device reported of the parties in power, to make the worse appear to be the better reason and impose upon the public, was the substitution of chicken-pox for small-pox. "Within a week the epidemic of small-pox that was so menacing has almost disappeared, and the chicken-pox is ravaging the community instead. Its greatest peculiarity is the fact that it has an affinity for adults in quarantined houses."

To consider this transformation, a mass meeting of the doctors was held on the evening of February 13th, and on the report of a special committee appointed to examine a particular case in question, which a reputable physician had reported as small-pox, but which the Health Officer discredited, the case was declared to be confluent small-pox.

For the week ending February 9th: Cases of small-pox reported, 15, and 5 deaths, 37 cases under treatment; diphtheria, 29 new cases and 5 deaths, 35 cases under treatment.

MINNESOTA.—Franklin Staples, M.D., President, Winona; C. N. Hewitt, M.D., Secretary, Red Wing.

Minneapolis, 223,700: E. S. Kelley, M.D., Commissioner, reports for December 163 deaths—58 under five years of age. Death-rate per 1000, 9.24. From zymotic diseases there were 28 deaths, of which 6 were from typhoid-fever; and from tubercular diseases, 26.

St. Paul, 155,000: H. F. Hoyt, M.D., Commissioner, reports for December 157 deaths—86 under five years of age. Annual death-rate per 1000 was 12.15. Deaths from zymotic diseases, 3; and from tubercular diseases, 19. Contagious

diseases reported, 53, of which 24 were of diphtheria and croup, 29 of scarlet-fever.

MISSISSIPPI.—W. F. Hyer, M.D., President, Meriden; Wirt Johnson, M.D., Secretary, Jackson.

MISSOURI.—F. J. Lutz, M.D., President, St. Louis; Willis P. King, M.D., Secretary, St. Louis.

The annual meeting of the Board was held at Jefferson City, Mo., January 4th. The Board will formulate legislation to present to the General Assembly. It will ask for the establishment of county boards of health, for the purpose of collecting vital statistics, and for an extension of its powers, so as to have control of all epidemic and communicable diseases.

St. Louis, 540,000: George Homan, M.D., Commissioner of Health.

Report for the month of December: Deaths, 663; under five years of age, 200; from zymotic diseases, 124—68 from diphtheria and croup; from phthisis and tuberculosis, 65. Annual death-rate per 1000, 14.7.

Kansas City, 124,000: R. P. Waring, M.D., Health Officer. Deaths for December, 106; under five years of age, 36. Annual death-rate per 1000 was 8.41. Contagious and infectious diseases reported for the month, 59, of which there were of diphtheria, 41, with 6 deaths.

NEBRASKA.—J. V. Beghtol, M.D., President, Friend; F. D. Haldeman, M.D., Secretary, Ord.

Omaha, 140,452.—Report of the Department of Health for November: Deaths, 80; from communicable diseases, 20; diphtheria and croup, 5; typhoid-fever, 4; scarlet-fever, 2; tuberculosis of the lungs, 9. Annual death-rate, 6.9.

NEVADA.—S. L. Lee, M.D., President, Carson City; J. A. Lewis, M.D., Secretary, Reno.

NEW HAMPSHIRE.—G. P. Conn, M.D., President, Concord; Irving A. Watson, M.D., Secretary, Concord.

NEW JERSEY.—C. F. Brackett, M.D., President, Princeton; Henry Mitchell, M.D., Secretary, Asbury Park.

Hudson County—Jersey City and vicinity, estimated 310,022.

Reports for the year 1894 : Deaths, 6338 ; under five years of age, 2795 ; from zymotic diseases, 1213. Death-rate, 24.2. Of the deaths from zymotic diseases there were from diphtheria, 222 ; typhoid-fever, 137 ; diarrhœal diseases, 383. Deaths from consumption, 593.

Newark, estimated 200,000 : Charles Sehlbach, M.D., Medical Officer of Health, reports for the month of July : Deaths, 551 ; under five years of age, 305 ; from zymotic diseases, 300 ; and from consumption, 39. Annual death-rate, 30.24.

The Common Council has overruled the Mayor's veto of the resolution appropriating $5000 for the establishment of an antitoxin laboratory.

NEW YORK.—F. O. Donohue, M.D., President, Syracuse ; J. S. Barnes, M.D., Secretary, Albany.

Fourteenth Annual Report of the State Board for the Year 1893 comprehends a more than usual amount of aggressive work ; first, of sanitary investigations in general under the spur of the then threatening attitude of cholera ; second, investigation of tuberculosis ; and third, of engineering work, illustrated by a volume of maps and charts showing their improvements in and original plans for the sewerage systems of twelve important localities. To be the better prepared to meet the threatening attitude of cholera, the State was divided into six districts, and from June to October as many special sanitary inspectors were employed to visit and confer with the health officers resident therein respectively, for the purposes of securing needful improvements. After October to the end of the year—on account of the stinted appropriation —two inspectors only were employed. There were, besides, three special investigations ordered by the Governor—Flatbush sewer, Newtown Creek, and Iselin Residence Park, New Rochelle ; and six other investigations and reports called for on complaints of citizens.

As a whole, the extraordinary inspection service, the investigations made and the reports thereon, are creditable to the service. The total mortality reported during the year was 128,274 ; the death-rate, 19.50—1.28 less than for 1892, and 1.93 less than for 1891 ; 33.6 per cent of the deaths at all ages were of children under five years.

From zymotic diseases in the aggregate the number of deaths was 180 per 1000 of the deaths from all causes. Deaths from typhoid-fever, 13.5 per 1000 of the total mortality—less by from 1 to 2.50 per 1000 than for several previous years. From diphtheria the number of deaths has been about 6000—1000 more than in 1892—the increase chiefly in the southern part of the State. From consumption the number of deaths reported was 13,169—a little more than one tenth of the total mortality; and about 2 deaths from this cause in each 1000 of the population. From acute lung diseases, the number of deaths was 160 in each 1000 from all causes.

On Food and Drugs.—Dr. Willis G. Tucker, Director of the State Board of Health Laboratory, reports a large amount of work done: Fifty water analyses made; 2637 samples of drugs collected from 37 places widely apart in the State, of which 2434 were examined and reported upon. Samples are classed as of "good quality" when they fulfil the requirements of the U. S. Pharmacopœia; of "fair quality" if, while not fully up to the standard, they are not evidently intentionally adulterated nor decidedly below the standard; and of "inferior quality" if clearly adulterated or falsified, lacking in any important constituent, deficient in strength, partial or complete decomposition or other causes, or contain an undue (?) amount of impurity. Of the 2434 samples examined there were of

Good quality	1,018, or	41.9 per cent.
Fair quality	446 "	18.4 "
Inferior quality	699 "	28.7 "
Not as called for	131 "	5.3 "
Excessive strength	140 "	5.7 "

As in previous reports, these results "by no means represent the proportions of good, bad, or indifferent drugs on the market and on sale at the stores, since only articles which were considered likely to be adulterated or known to be frequently of inferior quality were collected."

Of the Investigation of Tuberculosis.—The subject of Vol. II., the paper on the "Examination of the Milk Supply in the State of New York," by F. O. Donohue, M.D., President of the State Board of Health of New York, in our De-

cember number, is an admirable abstract, and to it the reader is referred for a concise statement of the detail of this volume.

For December, 1894, the State Board *Bulletin* reports there were 9000 deaths reported, or a daily average of 290, which is the same as that of October and 19 more than in November. The number of deaths is 1600 less than in December, 1893, when there were 1000 deaths from *la grippe*, and 500 less than in December, 1892. Compared with October, the relative infant mortality is higher by 1 per cent. The actual zymotic mortality is nearly the same as in the month preceding, there having been 1200 deaths from these diseases. There were 139 deaths from typhoid-fever, which is less by 50 than in November, the decrease being in all parts of the State. There was about the same decrease in deaths from diarrhœal diseases. Diphtheria also shows a falling off in mortality, in the maritime district especially. Scarlet-fever and measles have increased mortality, both of them being limited to the eastern part of the State, only 15 deaths of the 82 from scarlet-fever occurring outside of the maritime and Hudson valley districts, in the former of which all but 5 of the 35 deaths from measles occurred; extensive outbreaks of very mild scarlet-fever, with very small mortality, are reported. There were 11 deaths from small-pox, 4 occurring in New York, 3 in Brooklyn, 3 in the neighboring town of Newtown, and 1 in Ellenville, Ulster County, in the vicinity of which the disease developed early in the month. Recently a single case has occurred in Utica and in the town of Westchester. There were 400 more deaths from acute respiratory diseases than in November, but about 1000 less than in December, 1893, compared with which month in other local diseases there is not much variation, and there is no evidence that the mortality of the month is increased by *la grippe*, although some deaths have been reported from it; December has usually been the month for its recurrence to appear. Consumption shows the average monthly mortality of about 1100 deaths. The rainfall was in excess of the average, and the mean temperature was 1° below the normal.

New York, 1,925,562: Total deaths, 3052—1069 under five years. Death-rate, 18.66. Zymotic diseases per 1000 deaths from all causes, 130; 212 from croup and diphtheria. Deaths from consumption, 420.

Brooklyn, 1,012,200: Total deaths, 1741—607 under five years. Death-rate, 20.35. Zymotic diseases per 1000 deaths from all causes, 147.50; 193 from croup and diphtheria. Deaths from consumption, 217.

Syracuse, 91,944: Total deaths, 98—30 under five years of age. Death-rate, 13. Zymotic diseases per 1000 deaths from all causes, 140; croup and diphtheria, 10. From consumption, 10.

Albany, 98,000: Total deaths, 172—43 under five years. Death-rate, 20.65. Zymotic diseases per 1000 deaths from all causes, 122; croup and diphtheria, 8. From consumption, 29.

Buffalo, 300,000: Total deaths, 373—146 under five years. Death-rate, 14.58. Zymotic diseases per 1000 deaths from all causes, 215; from diphtheria and croup, 52. From consumption, 44.

Rochester, 150,000: Total deaths, 167—25 under five years. Death-rate, 13.40. Zymotic diseases per 1000 deaths from all causes, 121; croup and diphtheria, 12. From consumption, 19.

NORTH CAROLINA.—H. T. Bahnson, M.D., President, Salem; Richard H. Lewis, M.D., Secretary, Raleigh.

Bulletin of the State Board of Health for December: Twenty-seven towns, aggregating 139,604 population, deaths, 160; 83 were of colored people, and 44 were of children under five years of age.

The annual death-rates were 11.3 per 1000 for the white population, 17.3 for the colored population, and 13.8 for the total. From consumption, 38.

Asheville, 12,000.: Total deaths, 13; consumption, 3—visitors. Annual death-rate, 9 per 1000.

Charlotte, 14,000: Total deaths, 18. Annual death-rate, 14.4 per 1000.

Raleigh, 15,000: Total deaths, 18. Annual death-rate, 14.4 per 1000.

Wilmington, 22,000: Total deaths, 31. Annual death-rate, 16.9 per 1000.

NORTH DAKOTA.—Hon. W. H. Standish, President, Bismarck; F. H. DeVaux, M.D., Superintendent, Valley City.

OHIO.—Byron Stanton, M.D., President, Cincinnati; C. O. Probst, M.D., Secretary, Columbus.

Eighth Annual Report for the Year ending October 31st, 1893. Total number of deaths reported from all causes, exclusive of premature and still-births, 23,794. The average population of the cities and towns represented was 1,364,945. Annual death-rate per 1000, 17.43; 7298—30 per cent—were of children under five years of age. From *zymotic* diseases the number of deaths was 5240—20 per cent of the deaths from all causes. The chief of these were from: Croup and diphtheria, 1129; diarrhœal diseases, 1053; measles, scarlet-fever, and whooping-cough, 425; typhoid-fever, 718. Of small-pox there were two outbreaks at Akron and Norwood, both of which were speedily suppressed. From *consumption*, 2648—11.13 per cent of the total mortality reported.

Vital Statistics.—The Secretary again urges, as he has repeatedly heretofore, such legislative action as would be effective for the registration of vital statistics. He forcibly states that it is "by studying the age, sex, occupation, and domestic surroundings of various classes of decedents we arrive at facts enabling the State to decrease the losses in proportion to its capability of removing avoidable causes of death. Systematic efforts to prevent death losses—that is, sanitary work—can only be intelligently applied by knowing their extent and cause in each locality; and great progress in the saving of life can be made in no country until a fairly accurate system of vital book-keeping, which the registration of vital statistics may be called, is employed." His urgency of the need of effective measures for the protection of *public water supplies* should also win the favor of legislative action.

Cleveland physicians are a good deal exercised by Health Officer Leick's charging them with neglect to report contagious diseases. He reports for the year 1894: Total number of deaths, 5663—402 more than in 1893. He calls particular attention to his tabulated statistics, and says that "while the report of contagious diseases shows only 1 case of membranous croup, there were 76 deaths reported. There were 9 cases of puerperal-fever reported and 29 deaths; 9 cases of erysipelas reported, 13 deaths; 92 cases of whooping-cough, 75 deaths. This in itself, if reports were true, would show an alarming

death-rate (81.52 per cent) from whooping-cough—more so than from any other disease that was reported to us. It is highly probable that instead of there having been 92 cases of whooping-cough in the city, as reported, there were nearer to 2000 at that time. The increase in the death-rate from measles—99 in 1894 against 9 in 1893—can be explained by the number of cases reported, to wit: 95 in 1893 against 2499 in 1894. The same in scarlet-fever—697 reported in 1893 against 1854 in 1894; deaths, 46 in 1893, 338 in 1894. I am convinced that while only 1854 cases of scarlet-fever were reported, this figure represents probably one fifth of the actual number of cases in the city. The epidemic was of such a mild form that hundreds of cases were never seen by physicians, and consequently not reported. It is unfortunately true, on the other hand, that there are some physicians who neglect and refuse to report contagious diseases, and thus imperil the safety and lives of a neighborhood. No language is strong enough to condemn such cowardly actions on the part of a physician who is afraid to placard a house for fear of offending a patient or his friends."

Typhoid-fever and diphtheria show an increase in 1894 as compared with 1893: 281 cases of typhoid-fever, with 153 deaths in 1893, to 171 cases, with 89 deaths, in 1894. Diphtheria, 419, with 143 deaths in 1893; 332 cases and 107 deaths in 1894.

The number of births reported during the year was 9242—a decrease of 25 from the year previous.

The recent epidemic of scarlet-fever has more than ever demonstrated the necessity of an isolated hospital. At present there is not a hospital in the city of Cleveland that will treat such cases. To send a scarlet-fever patient to the pest-house is an obvious wrong that might result in great evil.

Toledo, 120,000: J. Wood, M.D., Health Officer, reports for December: Deaths, 139—25 under five years of age, representing an annual death-rate of 13.90 per 1000. From zymotic diseases, 15; from consumption, 13.

OKLAHOMA TERRITORY.—L. L. Parker, President, Kingfisher; C. D. Arnold, M.D., Secretary, El Reno.

PENNSYLVANIA.—S. T. Davis, M.D., President, Lancaster; Benjamin Lee, M.D., Secretary, Philadelphia.

Philadelphia, estimated to the middle of 1895, 1,163,864: M. Veale, Health Officer, reports: In the four weeks ending January 26th, deaths, 2019—647 under five years of age. Annual death-rate, 22.5 per 1000. Deaths from croup and diphtheria, 163; from typhoid-fever, 28; small-pox, 10; from consumption, 172.

Pittsburgh, 272,000: J. Guy McCandless, M.D., Registrar, reports for four weeks ending January 26th: Deaths, 446—166 under five years of age. Deaths from croup and diphtheria, 29; from typhoid-fever, 34; from consumption, 32. Annual death-rate, 21.31.

RHODE ISLAND.—A. G. Sprague, M.D., President, River Point; Gardner T. Swarts, Secretary, Providence.

Typhoid-fever is reported in Cumberland and Pawtucket, attributed to the usual source—foul water.

SOUTH CAROLINA.—J. R. Bratton, M.D., Chairman, Yorkville; H. D. Fraser, M.D., Secretary, Charleston.

Charleston, 82,870 white, 36,295 colored: 65,165: H. B. Horlbeck, M.D., Health Officer, reports for four weeks ending January 26th: Deaths, 226—96 colored. Under five years, 59; deaths from consumption, 18. Annual death-rates, whites, 12.15; colored, 34.38: 24.53.

SOUTH DAKOTA.—C. B. Alford, M.D., President, Huron.

TENNESSEE.—J. D. Plunkett, M.D., President, Nashville; J. Berrien Lindsley, M.D., Secretary, Nashville.

The principal diseases, named by the State Board *Bulletin*, in the order of their greater prevalence, in the State for the month of December, were lung diseases acute, typhoid-fever, scarlet-fever, consumption, *la grippe*, diphtheria, measles, malarial-fever, chicken-pox, rheumatism, whooping-cough, mumps, and dysentery.

Chattanooga, 40,000: Total deaths, 35—colored, 17. Annual death-rates per 1000, white, 8; colored, 15.69: total, 10.50.

Knoxville, 40,385 : Total deaths, 64—colored, 22. Annual death-rate per 1000, white, 16.11 ; colored, 28.97 : 19.

Memphis, 57,951 : Total deaths, 105—colored, 59. Annual death-rates per 1000, white, 17.04 ; colored, 27.68 : 21.73.

Nashville, 87,754 : Total deaths, 143—colored, 71. Annual death-rates per 1000, white, 15.81 ; colored, 25.69 : 19.55.

TEXAS.—R. M. Swearingen, M.D., State Health Officer, Austin.

UTAH TERRITORY.

Salt Lake City, W. T. Dalby, M.D., Health Commissioner.

VERMONT.—C. S. Caverly, M.D., President, Rutland ; J. H. Hamilton, M.D., Secretary, Ritchford.

VIRGINIA.—R. W. Martin, M.D., President, Chatham ; A. Irving, M.D., Secretary, Richmond.

Richmond.—The mayor's message, January 14th, compliments the Board of Health, and advises the establishment of a crematory, and the collection of all garbage, and thus remove all noxious, disease-breeding filth now lying about in the back yards or upon the dumps, much to the detriment of our city's health.

WASHINGTON.—J. R. Hathaway, M.D., President, Everett ; G. S. Armstrong, M.D., Secretary, Olympia.

WEST VIRGINIA.—W. P. Ewing, M.D., President, Charleston ; N. D. Baker, Secretary, Martinsburg.

Biennial Report of the State Board of Health, for the Years 1893-94 :

The State is reported to be remarkably free from epidemic diseases of all kinds. There have been two outbreaks of smallpox—one at Bridgeport, five or six cases ; and the other at Lewisburg and in the vicinity, where about twenty cases occurred. No deaths are reported from it.

Statistics of marriages, births, and deaths from the several counties are given, but singularly the populations are omitted.

WISCONSIN.—J. W. Hancock, M.D., President, Ellsworth; U. O. B. Wingate, M.D., Secretary, Milwaukee.

Milwaukee, 270,000: W. Kempster, M.D., Commissioner, reports for December: Deaths, 354—145 under five years of age.

Cases of infectious diseases reported: Diphtheria, 42; scarlet-fever, 19; small-pox, 106; typhoid-fever, 41; measles, 1; admitted to City Isolation Hospital, 57.

Deaths from diphtheria and croup, 33; typhoid-fever, 7; small-pox, 30; whooping-cough, 18; consumption, 35.

Appleton, February 11th.—It is reported (*Crescent*) that there are upward of 50 cases of *diphtheria* now in the city. Whether this statement is an exaggeration or not, it is certain that there are a number of cases of a dangerous type in the city.

WYOMING.

Cheyenne, January 14th.—*A Bill* has been introduced into the Legislature to create and establish a State Board of Health, and to regulate the practice of medicine.

CANADA.

The provision for vital statistics is among the last duties which any government undertakes. Beyond a more or less imperfect census every ten years there are no statistics obtainable in Canada which are of considerable value. The work is left entirely to the separate provinces, and even there it is dependent almost entirely upon the good will of a few medical men. But in some cases the figures are actually misleading. In Quebec the birth of Catholic children is recorded accurately by the Fabrique, which is a religious institution; while the registration of Protestant births is optional. There is a law on the subject, but no penalty is attached to its non-fulfilment, so that it is inoperative. All deaths, however, Catholic and Protestant, are recorded; so that, while the Catholic record is correct, the Protestant record always shows a death-rate far in excess of the birth-rate, on account of the failure to record all the births occurring among Protestants. This is given merely as an example of the unreliability of Canadian vital statistics. In many provinces no attempt is made.

An inquiry addressed to Dr. A. P. Reid, Secretary of the Board of Health for Nova Scotia, brought the following reply:

" We have no record of vital statistics in this province, and I am unable to satisfy your demand."

The reply from Dr. G. E. Coulthard, Secretary of the Board of Health for New Brunswick, was of a similar nature: " I am very sorry to say that vital statistics in this province are very poorly kept, and do not, thus far, adequately represent the births and deaths that actually occur. At the last session of the Legislature the law was made more stringent, and, if I remember aright, a penalty for violation of law threatened. I intended, in the forthcoming annual report of the Provincial Board of Health, to give the vital statistics a chapter; but on consulting with the Deputy Provincial Secretary, was informed by him that they were incomplete, and not representative."

In Quebec, during the present year, a system was inaugurated, and, so far as the Catholic population is concerned, will be accurate; but, for the reason given, it must fail when applied to the province as a whole. In the western provinces the population is too scattered to permit of useful work being done.

The cities, however, do better; and following is a record for Montreal during the week ending January 19th: Total deaths, 109. Deaths due to infectious diseases, 16; phthisis, 13; other diseases of the lungs, 24. This yields a death-rate per 1000 of 24 against 19 in New York, 14 in London, and 17 in Paris. ANDREW MACPHAIL, M.D.

MONTREAL, January 18, 1895.

CREDIT SIDE OF THE CHOLERA ACCOUNT.—A reduction of more than 15 per cent in the general death-rate is, grossly stated, the claim made for the sanitary administration of Great Britain initiated by Sir John Simon in 1865, when he undertook the defence of that country against Asiatic cholera. Abandoning *in toto* the system of defence by quarantine restrictions, as against that individual disease, a vast machinery of notification, isolation, and disinfection, with reference to the infectious and contagious diseases generally, has been organized, the efficiency of which may be measured, with substantial accuracy, by the statistics of one group of diseases —the typhoid or enteric and other continued fevers. Thorne-Thorne has recently shown that, whereas the mean annual

death-rate of this group was 567 per 1,000,000 living in the five years 1869–73, it was only 179 in the five years 1888–92; that if, during this latter quinquennium, people had died of these fevers at the rate at which they died in the former five-year period, there would have been during 1888–92 no fewer than 55,808 more deaths than actually occurred; and that had the same mortality obtained in 1892 that prevailed in 1869 no less than 14,232 persons who, at the end of 1892, had escaped death from these causes, would have died during that year. "In short," he says, "even if cholera had recurred in England and Wales between 1867 and 1892—a period during which that disease was practically absent from our midst—on the same scale as between 1849 and 1866, we should still be the gainer by several hundreds of thousands of human lives. And our gain in this respect is largely due to the incentive given by reason of cholera prospects and of the knowledge that the disease would have to be met by improved sanitary administration."—*Journal of the American Medical Association.*

THE LATE DR. ALFRED L. LOOMIS.—At a meeting of the New York Pathological Society, held on February 13th, 1895, the following resolutions on the death of Dr. Alfred L. Loomis were adopted and spread on the minutes:

Whereas, It becomes our duty to announce the death of Dr. Alfred L. Loomis, a former President and for a long period a cherished member of the New York Pathological Society, therefore be it

Resolved, That this society desires to place on record its high estimation of those qualities for faithful, persistent, and skilful work which characterized all his efforts during more than a quarter of a century of active membership.

Resolved, That his minute and painstaking study of clinical facts in connection with pathological lesions, and his logical demonstrations of their practical significance, constantly proved his eminent fitness as a safe teacher and his high and rare qualifications as a leading authority.

Resolved, That his example of indefatigable labor in this society, his ever-ready willingness to advance its best interests by valuable contributions from his large experience, and his earnestness of purpose in extending its usefulness are grateful remembrances of his unselfish ardor, of his conscientious regard of duty, and of his earnest devotion to the highest aims of pathological research.

NEW BOOKS AND BOOK REVIEWS.

ANY BOOK reviewed or advertised in THE SANITARIAN costing $1.50 or less will be sent *free* to any present subscriber sending the name of a new subscriber, or to any new subscriber on receipt of the full subscription price sent on his own account; or any book so reviewed or advertised costing more than $1.50 will be sent at a discount of that amount.

ANTISEPSIS AND ANTISEPTICS. By CHARLES MILTON BUCHANAN, M.D., Professor of Chemistry, Toxicology, and Metallurgy, National University, Washington, D. C. With an Introduction by Professor Augustus C. Bernays. 12mo, pp. 368. Illustrated. Price, $1.25. Newark, N. J.: The Terhune Company.

This should be a particularly welcome book to the surgical practitioner. The introduction, by Professor Bernays, was evidently written after a thorough examination, for he says of the work, that "It gives the views of the best living scientific biologists who have experimented in the field of pathogenic bacteriology. It also has compiled the practical rules followed by many of the best surgeons in the world in their daily work. These rules and recommendations are based on the results obtained in thousands of surgical cases. . . . The details of the technique and the rules of practice laid down in this little book will do much good, and I wish that it may find its way into the hands of every physician. The arrangement of the text affords ready reference, containing as it does a copious index both of authors quoted and of subjects treated."

CHEMICALLY PURE HYPOPHOSPHITES—THERAPEUTICAL INDICATIONS, WITH DATA. Edited by R. W. GARDNER, Pharmaceutical Chemist. Pp. 200. R. W. Gardner, 158 William Street, New York.

This is an elegantly gotten-up manual of the therapeutical indications and therapeutic action of the hypophosphites, as observed by many physicians. Numerous cases are cited from the practice of clinicians of high repute, showing the advan-

tage of a thorough acquaintance with the varied effects obtainable by the use of the hypophosphites alone in graded doses or in combination with other salts. The author quotes freely the writings of Dr. Churchill on the curative effects of the hypophosphites in phthisis, and attributes their failure in most instances to the non-observance of Dr. Churchill's methods in their preparation or use. He emphasizes this by the following abstract from Churchill's "Methods in Phthisis":

"1. The hypophosphites of soda, lime, and quinia are the *only ones indicated.*

"2. The hypophosphite must be *chemically pure.*

"3. They must *not be combined* for use in phthisis.

"Why not? Because they act in antagonism to each other, the different bases being indicated in *different* stages of the disease and the several salts differing in therapeutic action.

"Churchill *never uses them in combination.*"

Indeed, the author would emulate Churchill in particularity, and he enjoins throughout the utmost accuracy in chemical manipulation and purity of material.

The work is not offered for sale, but as a gratuity to any physician applying for it, enclosing his card with the application. R W. Gardner, 158 William Street, New York.

A PRACTICAL THEORY AND TREATMENT OF PULMONARY TUBERCULOSIS. By FRANK S. PARSONS, M.D., editor of the Philadelphia *Medical Times and Register.* Price, 25 cents, paper cover. Philadelphia: Published by the Medical Publishing Company, 718 Betz Building.

This monograph covers seventy-seven pages of a neat little volume. It treats of a subject of universal interest to all scientifically inclined persons.

The author views tuberculosis in a new light, and from a more rational standpoint than any that has recently been advanced.

The first pages are devoted to an interesting introductory, illustrative of the present condition of medical thought upon the subject. The causation of tuberculosis is then taken up, and it is shown that the dominant theory regarding the tubercle bacillus as a causative agent is not, in the judgment of the author, based on the true pathological condition in the early

stage of phthisis. Bacilli are to be regarded only as developments, existing because a favorable medium presents. This medium exists before the bacillus is demonstrable, and consists of the waste elements of the blood congregating in a locality through lymphatic obstructions or stasis.

In the pages devoted to a consideration of symptomatology it is suggested that, in view of the universal dislike of fats by phthisical persons, there doubtless exists a disordered condition of the pancreas, which condition may be congenital or acquired.

Dr. Parsons has based the treatment of consumption on the lines of this new theory, calling attention to the advantages to be gained by elimination, nutrition, and oxygenation. The low price of the book places it in reach of every one, and no physician should be without it.

MEDICAL, PHARMACEUTICAL, AND DENTAL REGISTER-DIRECTORY AND INTELLIGENCER, WITH SPECIAL MEDICAL, PHARMACEUTICAL, AND DENTAL DEPARTMENTS, CONTAINING DETAILED INFORMATION OF COLLEGES, HOSPITALS, ASYLUMS, MEDICAL SOCIETIES, ETC., FOR PENNSYLVANIA, NEW YORK, NEW JERSEY, MARYLAND, DELAWARE, AND THE DISTRICT OF COLUMBIA. Third edition. 8vo, pp. 838. Philadelphia : George Keil.

The fulness of this title-page so clearly indicates the scope of the work as to render an extended notice unnecessary. It will suffice to state that it is arranged with the utmost degree of convenience, and appears to be a complete register-directory of the professions represented.

CONTEMPORARY LITERATURE.

THE ARAB CHARACTER.—One day I was the guest of a general commanding the chief military division of Northern Africa. It is better not to mention names, for people with official responsibilities usually dislike being quoted.

My acquaintance with General —— arose, however, through

a good mutual friend ; and as I was treated with frankness, I have every reason to consider his views of consequence.

"Can you trust these Turcos and Spahis in case of war?" I asked him.

To this he replied by telling a story. That he had once been in the position where he was able to save a great Arab chief from disgrace and beggary. That chief had been friendly with him for many years, and was so overwhelmed by gratitude that he brought the general a costly present.

"I never accept presents from natives," said the general, in parenthesis. "Whoever accepts a present from an Arab loses his authority at once."

The chief was very much chagrined at the general's determination, and sought in vain to alter it. Finally, in a fit of uncontrollable emotion, and with a choking voice, he raised his hand solemnly and said :

"General, you have saved me from dishonor. I owe you all I have. Let me make you a gift more valuable to you than any precious stone. It is one word of advice : *Never trust an Arab—not one—not even* ME !"

With which strange, not to say paradoxical, warning the chief disappeared.

"That happened several years ago," said the general, "but each day I realize more fully the value of that strange gift. The Arab has his nature, which is not yours or mine. He may live twenty years with you ; respect and admire you ; serve you faithfully ; even spill his blood for you—but all that counts for nothing. The next year he may cut your throat." —*From "French Fighters in Africa," by Poultney Bigelow, in Harper's Magazine for February.*

MRS. BALLINGTON BOOTH'S OPINION OF AMERICAN SLUMS. —In contrasting the denizens of the Old World slums with those of the New, I should say that the brain capacity, wit, and spirit of the people is far in the ascendancy here, while the crime and desperateness for evil may be additionally strong. Again, it should be remembered that in some cities the slums are exceedingly cosmopolitan. This is particularly so in New York City and the city of Chicago. To meet this difficulty we have in our Slum Brigade representatives of all

the different nationalities, French, German, Swedish, Norwegian, Danish, Irish, Italian, and American, which enables our workers to reach many who could not possibly be reached and dealt with in other than their own language.—*From "Salvation Army Work in the Slums," by Maud Ballington Booth, in the January Scribner's.*

CHARACTERISTICS OF GEORGE INNESS.—George Inness had no jealousies and few amusements. He smoked some, and took long walks. Often he painted fifteen hours a day. On the dozen or more canvases in his studio he worked as the humor seized him, going from one to another with palette and maul-stick, and always standing when painting. He had two styles, one restrained, the other impetuous, and as he grew older the latter prevailed. Correctness of linear design was less important than color, atmosphere, and chiaroscuro; but first in importance was the resolve to convey distinctly the impressions of a personal vital force. Believing that he obtained with oils all the delicacy of water-colors, and much strength in addition, he did not paint in water-colors. His sincerity, his faith, his earnestness—all that which escapes like a perfume from his works—increased with his years, and with the honorable fame and competence that he had earned. One of his landscapes is called "Light Triumphant"—a name that fitly describes them all.—*George William Sheldon in the Century for February.*

VIN MARIANI.—The producers of Mariani wine should, according to report (*The Court Journal*, London, January 12th, 1895), soon have a splendid market in Russia for their nerve and brain tonic, as the Dowager Empress has, at the suggestion of the Princess of Wales, drank it since the death of her consort, with the most remarkable and beneficial results. It seems that Her Majesty is one of the many delicate persons with whom stimulating drugs like quinine, iron, and Peruvian bark disagree; but such is not the case with the wine tonic referred to. It is well known that the Princess of Wales also derived increased strength of brains and nerves from it during her last great trials. Moreover, in consequence of the benefits obtained by the empress, a great demand for this tonic

has sprung up among ladies of Russian aristocracy suffering from "nerves."

THE CLIMATOLOGICAL YEAR AT LOS ANGELES, CAL.—The past year has been a dry and cool one—the thermometer averaging 2° lower than usual, and there being but half the ordinary rainfall. Counting by years, there were 7.52 inches of rainfall in Los Angeles, but reckoning by seasons, the season of 1894 had but 5.52 inches—about one third the average amount. This is the only true scientific way to record the meteorological reports. There are but two seasons in Southern California—the wet and the dry. Spring, summer, fall, and winter are meaningless terms here—so are the artificial divisions by years. Our real spring is in the late fall. Growth and the new season commence either in November or December. "The early and late rains" of November and December and February and March, with lighter sprinkles in January, make an ideal season—just what seems in store for us in 1895. Every month except October was slightly more than 2° colder than normal—and October just reversed these figures by registering an average of 2° warmer than usual. Old Sol presented an unclouded visage 153 days, kept his features partly hidden, usually in the morning, for 167 days, and for 45 days he was obscured either by clouds or rain. The highest temperature was September 15th, when it reached 99°, and the coldest, January 6th, 32°—those being extremes of heat and cold, the mean for these respective days being 72° and 42°. In short, we have had a very comfortable year; the present season, however, is much more cheerful, for there is very good promise of large and paying crops—just the sort of weather to make one contented with this life and make him fully satisfied with the climate this side of the famous Styx. In sooth, we doubt if the Elysian fields are more balmy or fertile than the plains of Los Angeles.—*Southern California Practitioner, January*, 1895.

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THE NEED OF A NATIONAL BOARD OF HEALTH.

By CHARLES O. HISCOCK.

FROM the days of sacred history governments have looked after the health of their people. The ancient Oriental monarchies paid some attention to State prevention of disease. Greece had a chief medical officer as a part of the State administration, and no function of the government was looked upon as more important or fostered with greater zeal. Rome followed in the footsteps of Greece. Her emperors appointed regularly general as well as local health officers, and the success of her legions and the triumph of her power was due, not to a small extent, to this fact.

During the Middle Ages, when States were cut up into petty serfdoms and there were no sanitary regulations, disease ran wild, and the pages of mediæval history are blotted by sketches of pestilence and plague. By the time that the crusades had marched their hosts toward the East, leprosy had invaded the most northern country in the temperate zone. All kinds of diseases were exceedingly prevalent, and people were mowed down in appalling numbers. But with the fall of feudalism and the rise of monarchy civilization began to thwart the destroyer.

Following the suggestions of the Mosaic law, the modern nations began to legislate against disease, and nearly all enlightened nations now stand arrayed against it. In our mother country we find the Government Board of England. The results of its efforts are attracting the attention of the civilized world. Statistics show that for the years 1876–80 the mean duration of life in England had been extended two years for

men and three years for women. Germany has an Imperial Board of Health, and the results of its deliberations are not only saving thousands of lives, but also adding millions of marks to the German treasury. In Japan a National Board of Health has been established, and is operating under the most advanced methods. In Italy a physician holds a Cabinet secretaryship, and Mexico has an Imperial Board of Health.

These are examples of the national governments taking an active interest in this great subject; but the United States of America does not belong to the category. We lead in most things, but we do not even follow in this. While others are doing so much, we take our position as an interested but practically non-active republic.

RECORD OF THE UNITED STATES.

When our government was established in 1789 we instituted, along with other governmental machinery, some regulations with regard to quarantine; and at different periods up to the present time these have been made more and more perfect. But not until 1873 was any attempt made for the nation to take a decisive stand against disease within our borders. At this time the question was discussed in different parts of the country, and bills were presented to the United States Senate for the establishment of a National Board of Health, but for some reasons it was an unfortunate time, and nothing was accomplished. In 1878, being spurred on by a series of resolutions drawn up by Dr. Henry B. Baker, of the Michigan State Board of Health, Congress passed an act establishing a National Board of Health. The Board consisted of eleven members—seven civil physicians to be appointed by the President, one medical officer of the Marine Hospital Service, one army surgeon, one navy surgeon, and the Solicitor-General.

This Board started out with great determination for usefulness. By employing experts it studied the means of preventing the great foreign diseases, and thoroughly investigated more than thirty subjects bearing directly upon sanitary matters which could not have been handled without national aid. A magazine writer of the time says: "We must regard the National Board of Health as a decided success. Of no little present utility and of great future promise." Unfortunately,

the duties of the Board expired by the limitation of the act in 1883—only four years after it was founded. The question then arose as to whether Congress would grant the necessary appropriations for the continuance of its work. This was a critical moment, and the opponents of the Board did their best. Reporters, who did not understand the great work that it was doing in the advancement of scientific research, wrote against it; and there was, as usual, a large number of Congressmen who wanted to go on record as voting to cut down expenses. No appropriations were made. The members dropped out; and, as all bills for re-establishing the same have been defeated, we stand to-day, as we have stood since 1883, without any organized central system of health administration.

NATION OR STATE—WHICH?

Many of the arguments which are presented in favor of national control of the currency, naturalization laws, and the tariff apply equally well to national control of the health of the citizens of the United States. Our government makes elaborate investigation into the science of agriculture and the diseases of cattle. Are these things of more importance than the health of the citizens of our country? There are about twenty divisions in our national service engaged in scientific work, the results of which are sent out to the people in frequent reports; but aside from the regular census taken each ten years there is no agency for furnishing information in regard to the public health. Is the dissemination of garden seeds of more importance than the dissemination of seeds of health? Why raise forts and cast cannon and drill troops to protect our citizens, and take no steps to protect them from the ravages of disease?

Then, too, this is a subject which cannot always be settled by local authorities. Let us examine a few examples: 1. Hydrophobia is a case in hand. The laws of one State may allow dogs to go unmuzzled. A rabid dog near the State line crosses the border into a State which has the most stringent laws, and bites a hundred people, who die the most terrible of deaths before it can be prevented. 2. Take, for example, two cities, Omaha and Council Bluffs. Nebraska may

have very strict laws regarding isolation and disinfection, and Omaha, in that State, may be of itself quite safe from disease; but almost within a stone's throw is Council Bluffs, another large city, in a different State. People are constantly passing back and forth, and if the health regulations of Iowa are poor, Omaha will be powerless to check disease. 3. One of the great questions of to-day is river pollution. The State of Mississippi may have very loose laws regarding this, and the sewers of the city of Vicksburg may pour billions of typhoid-fever germs into the Mississippi River. The city of New Orleans, a short distance below, in another State, may be obliged to use the river water for drinking purposes, but Louisiana is unable to stop the contamination of the water. 4. For an equal advantage each State should bear an equal burden. This is not true in the matter of prevention of disease when left exclusively to the State boards. The States of New York and Michigan have to encounter the immigrants from the Old World and Canada, and to renovate them before they go farther inland. It is most unjust to place the whole burden upon these border States. 5. Certain parts of the country are more subject to particular diseases than other parts, as is clearly brought out by the colored plates of the United States census reports. The burden of consumption is thrown upon the coast lines and the Ohio Valley. The burden of pneumonia upon the Mississippi Valley and the States of Nevada, California, and South Dakota. The burden of malaria upon the Gulf States and Eastern Montana. It is the most just thing in the world that the nation as a whole shall wipe out these sectional diseases for the common good of a common people. These five examples are only types of a myriad of cases which might be mentioned to show the absolute necessity for national action. The State boards have their work to do, but the national duty is no less potent. It is a case where the State and nation must join hands and work in unison.

CONSTITUTIONAL OR UNCONSTITUTIONAL.

The most noted argument presented by the opponents of a National Board of Health is the fact that it would not be constitutional. The principle of constitutional law touched by this matter is that the National Government would be in-

terfering in matters which rightfully belong to the States; that Congress would be exceeding its power in legislating a department into existence which would dictate to local authorities on sanitary regulations. Three great overbalancing arguments may be hurled against this objection: 1. Congress has the power to regulate commerce, and in cases of epidemic would necessarily have the right to make plans for removing any obstacle and thus provide for the free exchange of commodities. 2. State rights are not what they were in the early history of our country. The single commonwealth is overshadowed by the strength of the nation. Less than one year ago the President has fulfilled the function of the individual State by sending national troops into the city of Chicago to maintain order, and in spite of the objections of Governor Altgelt, the conscience of the nation upheld the action of the general government. 3. The work of the National Board of Health would be largely in the form of help rather than hindrance or interference. It would go into matters of research which cannot be accomplished by State boards, would collect, arrange, and disburse valuable material and statistics to the different States, and would quietly carry on a work in no way interfering with the State laws which would be invaluable.

COMPARATIVE IMPORTANCE.

There are weighty moral arguments in favor of a National Board of Health; but, judged simply from an economic point of view, the prevention of disease is one of the most stupendous questions of our nation. It is said that "the ignorance of the laws of health has conscripted more people for the grave than all of the battlefields of the world." The record of our own country is no exception to this statement. The census of 1890 shows that 524,000 deaths occurred in that single year. What were the causes? One hundred thousand by consumption, 40,000 by typhoid-fever, and standing high up in the list were pneumonia, diphtheria, scarlet-fever, measles, malaria, and many other germ diseases known to be preventible. It is estimated by the best authorities that over one half of the deaths which occurred in the United States during the year 1890 were of a preventible nature. Taking this as a standard, there were over 250,000 unnecessary

deaths in this single typical year. Look for a moment at the money loss to the country. Conservative estimates place the value of the average adult life to the State at $1000. Two hundred and fifty thousand deaths at $1000 each would make a loss of $250,000,000. Then, taking as a standard the estimates of leading physicians, and from a careful study of statistics concerning sickness in different States, I believe it fair to state that the loss of time by those who are sick with these diseases and recover; the salaries of attendants and nurses; doctors' fees and medicine; loss of clothing and other property by disinfection—all turned into productive pursuits would easily foot up to an equal sum. Thus by unnecessary sickness and death we have an annual loss to the United States of half a billion of dollars—a sum which would each year pay all of our national expenses, an amount twice as large as the annual receipts from the tariff. In two years it would pay our entire national debt. In three years it would equal all of the metallic and paper money in circulation within our borders. In twelve decades it would equal the present wealth of the republic. How necessary it is, then, to take immediate action. In spite of the magnitude of the problem, we have the spectacle of a billion-dollar Congress, and not a copper for the investigation of life saving. From the money side of the question, it is the policy and from the ethical side the duty of our government to make an effort toward a rational solution.

MAGNIFICENT FIELD FOR LABOR.

The field of the National Board of Health would be broad. Its functions would be many. Only a few of them can be mentioned here:

It would apply the most skilled scientists and the most perfect apparatus to improve methods and make new discoveries relating to the preservation of public health.

It would keep the State boards constantly informed of such progress through regular pamphlets and bound annual reports, so that the State boards could disseminate this information to the best advantage. The daily and weekly press and the monthly magazines and reviews would comment upon these reports, and through the double channel this information would be brought home to every fireside.

It would prepare bills of needed sanitary legislation and present them to proper committees of Congress, and would aid in securing uniform laws on the subject in the different States.

It would help to secure the establishment of boards in every State, and would complete the State local board system into a great network, through whose meshes no important reforms could escape. The State boards would act as a medium of application for the information furnished by the National Board, and in return would give statistics and facts to be tabulated and made useful by the central organ.

It would make a careful study into death-rates and the distribution of diseases in relation to vocation, nationality, locality, and condition of living.

It would educate a body of scientific statisticians who would be indispensable in the careful collection of sanitary statistics for the United States census. It would investigate the methods used by foreign countries in the prevention of contagious diseases, and would advise the President as to the action which should be taken in the case of any international or interstate difficulties caused by health or sanitary matters.

It would answer any questions forwarded by State boards, and would send specialists into any part of the country to aid the State boards in handling any special outbreak of disease.

It would cause the whole country to act as a unit toward the preservation of the life and the health of its citizens.

Such are the great benefits to be derived by the establishment of this national organ ; such the volume of wealth to be added to our nation ; such the amount of happiness to be given to our people ; such the increased lustre for our civilization. Truth must advance or it will decline. This is an instance where its development depends upon national aid. And as health and wealth are reciprocal terms, the establishment of this Board would follow out the most deep-rooted precepts of political economy and political wisdom. Preventive medicine is one of the most important questions of the hour ; and still self-preservation, which is the first law of nature, is always the last law of our legislators. Let us wake up to the fact that " time is money," and that " life is worth saving," and we may then hope to see established at an early day a National Board of Health.

ALBION COLLEGE, MICH., February 1, 1895.

DOMESTIC GARBAGE DISPOSAL.

THE HOUSEHOLD CARBONIZER.

By W. F. Morse, New York.

THE true answer to the question of a satisfactory disposal of garbage has been stated by some of the best-informed sanitarians to be the destruction or disposal on the premises where produced of every kind of household waste except ashes.

As to the method to be employed in doing this there are differing opinions, but the weight of authority seems to be in favor of incineration.

One medical man says: "If you ask me how to transport the garbage of Manhattan Island, I reply, by not transporting it—by leaving it where it is until we manipulate it and make it worth buying, and the buyers will remove it quick enough." This argument fails by assuming that garbage has a value. The average quantity daily to be removed from each individual household in New York City is so small that the expense and time consumed in obtaining it is more than the value of the material collected.

No contractor will go from house to house and daily remove the garbage unless he is paid for the work, much less will he pay anything for the privilege; and no householder will allow the garbage to remain until a quantity sufficient to reimburse the contractor has accumulated. So the burden of collection and disposal is thrown upon the city, and is paid for by increased rates of taxation. "But," says another authority, "there is no need of anything accumulating; burn it in the kitchen stove." This custom of burning waste in the stove or range is practised by a few, is advocated by more, but is found to have some difficulties. Garbage or swill contains from 40 to 80 per cent of water; and at certain times of the year, when melons are in market, when fruits are plentiful, and the housewife is preserving or canning for future use, there is a bulk of waste which is formidable.

To burn this takes fuel and time, is always attended with noisome odors in the house, destroys the stove fittings and linings, and is certain to discharge a pestilent, offensive smoke and smell from the chimney. The kitchen-maid finds it much easier to throw the garbage into a pail or vessel, with no care for the quantity of liquids, rather than drain out the water, keep up a fire, and patiently burn the wet mass by slow combustion. In theory, the stove disposal is a beautiful idea to preach, but in practice it is a most difficult thing to get done.

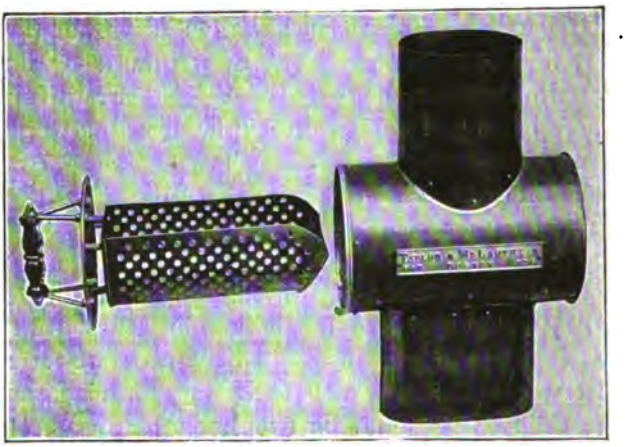
Still, many civil officers, having charge of the waste collection and removal, insist and urge that the house disposal is the true way to solve the problem. If each house could care for its own worthless matters, could turn into money the discarded articles that have any value, and leave nothing to be removed by the city except incombustible ashes and the like, then this vexatious question would have no more terrors, and the great sums of money now spent in removing and caring for putrescible waste would be used for other and better purposes.

This conclusion will be accepted by the largest majority of those who have given the subject attention, and if it can be realized will afford relief to all.

For several years there have been efforts made to introduce attachments to stoves that would care for waste in a cleanly way, and which would do the work required and not be troublesome to operate. Most of these inventions proceeded upon the plan of burning by a hot fire garbage containing water in suspension, insisting that this should burn from the bottom upward with a down draught, thus reversing the natural law of combustion, and failing in the effort to do by main force what could have better been done by a little attention to obvious facts. Other methods deposited the garbage in the end of the fire-box or at the back of the oven, where the space was limited, and from which it had to be transferred to a bright fire to consume it. None of these inventions have been found to be practical or have met with favor.

The household carbonizer proceeds upon a different plan. Recognizing the fact that household waste, when dried, will burn freely, and when carbonized or turned into charcoal can be used for fuel, this invention first places the garbage in a

position where the water is driven off and the residuum transformed into a substance that will not only burn without extra fuel, but can be utilized as a new fuel or as a means of beginning a new fire.



In the joint of pipe or elbow that makes the connection between the stove or range and the chimney flue is placed a horizontal cylinder, somewhat larger in diameter than the pipe or elbow, and in length about twice its diameter. One end of this cylinder is removable, and attached to the inside of this is a basket or scoop, made of perforated iron a little shorter and smaller than the cylinder itself. The area of space around the basket is equal to the area of the pipe from the stove, so there can be no obstruction to the draught.

When the carbonizer is to be used, by means of a handle the cylinder-head and basket are withdrawn and the scoop filled with garbage and replaced. Small quantities of liquid are retained in the bottom of the scoop, which is not perforated. The heat from the fire passes around the basket and through the perforations, driving off the water and chars the garbage into charcoal; the basket is then withdrawn and its contents emptied into the fire, burning with a clear, clean flame without offensive smoke. Or the charcoal may be left until morning, and with the addition of a bit of paper and a stick of kindling used to start a new fire.

This operation of driving off the water by slow heat at a

moderate temperature does not disengage the noxious gases that are thrown out when the green garbage is placed in a hot fire; and as this work of evaporation is done in the smoke-pipe, there is no chance for escape of odors or vapors into the room.

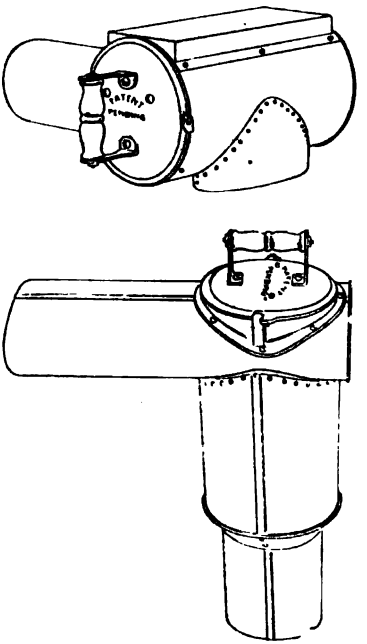
The convenient location of the carbonizer permits waste to be put at once into the scoop as fast as produced, saving steps for the servants and preventing any accumulation of offensive matters.

The carbonizer can be put into the place of a joint of pipe of any size; or, if the height is not enough for a joint, can itself be used as the elbow or chimney connection. For set ranges arrangements can be made to connect with the chimney flue. For large houses, restaurants, hotels, etc., where the quantity of waste is large, the carbonizer assumes a rectangular shape, is vertical instead of horizontal, is enlarged to the capacity desired, and provided with sliding doors or covers which receive the garbage. The scoops or baskets are not removed; but the garbage, after being carbonized, is discharged through small doors at the bottom. The operation is continuous and requires no attention except to remove the charcoal and destroy it.

There are several sizes of the carbonizer—from the smallest designed, for a single family, up to the largest, destroying three or four barrels of waste per day. It may be made to correspond in style with the general fittings of the most expensive range or built in an inexpensive way and sold at a small price.

This device is not merely a paper invention. For eight months it has been thoroughly tested and found to perform the work as above described. In houses where the carbonizer is used there is a notable absence of the garbage can, and the visits of the garbage collector are not required. It is abso-

lutely a perfect substitute for those disagreeable household attachments, since there is nothing produced that cannot be turned into charcoal by the carbonizer excepting ashes from coal fires, tin cans, and broken crockery, and these are delivered to the weekly ash collector free from any contamination of putrescible matter and in perfect condition to be deposited anywhere without subsequent nuisance.



If it were possible to apply this or some similar invention on a large scale by legal ordinance, it would stop the carting of garbage through the streets, abolish the garbage dumps, do away with all sea dumping and water contaminations, save tremendous sums of money, and bring peace and happiness to the souls of the city officials, whose duty compels them to collect and dispose of this vast bulk of dangerous and disease-breeding matter.

This practical, inexpensive sanitary invention is a contribution to the progress of sanitation which is not equalled by the more pretentious and costly disposal methods heretofore in use. The simplicity of the device, the ease with which it can be applied, and the satisfactory way in which it does its work commends it to the attention of those who are looking for some relief from the garbage nuisance. The accompanying drawings show the construction in three separate styles.

STABLE MANURE, AND MANURE DISPOSAL IN NEW YORK.

REPORT OF THE SANITARY COMMITTEE ON THE MANURE QUESTION, WITH RECOMMENDATIONS, HEALTH DEPARTMENT OF NEW YORK, DECEMBER, 1889.

IT is only necessary, we trust, in order to emphasize the sanitary importance of the manure question in this city, to invite the attention of the commissioners to the large number of complaints that are made by the people of all stations of life, calling the attention of this department to the annoyance to them from the foul odors caused by the present method of handling manure. All of these people assert that they are seriously annoyed by the odors—some, of course, more so than others. It is maintained by many that these odors enter their living, sleeping, and eating rooms, interfering with rest, causing nausea, loss of appetite, and consequently leading to depreciation of the vital forces that depend for their proper vigor on physical and mental rest, good appetite, and good digestion. Reputable physicians complain frequently in similar terms in behalf of patients, not infrequently using vigorous methods of expression as indicative of disgust or distrust on their part with the seeming indifference of the sanitary authorities of the city. While it is true that much has been done already to lessen the burden of the people in this respect, still complaints of a similar tenor are made continually, and therefore it appears to be high time for the department to take such action as will give to the people, if it be possible, freedom from the annoyances and ill results caused by the foul and offensive odors that arise from the present method of handling stable manure. The foul and offensive odors resulting from other classes of business carried on in the city are subjected to rigid control and strict surveillance by the department when their source is ascertained. In the manure business, however, in which no question can arise as to the genuine cause of foul odors, or that their effects on the human system are parallel

with the results of foul odors from other causes, no such comparatively decisive steps have yet been taken to abate or abolish them.

For the practical consideration of the problems that arise in connection with the disposal of the manure made within the city of New York, and the relief of the people of the city from the foul and offensive odors arising from it, it seems well to divide the interests directly associated with the production of it into three distinct classes—viz., (1) the producers of manure; (2) the manure merchants, or "riders" of manure; (3) the consumers of manure.

The direct producers of this product are horses, of course. Of these there are in round numbers about 60,000 below One Hundred and Thirty-fifth Street. It is estimated that a horse will drop about 15 pounds of manure *per diem* on the stable premises, which will make the entire daily product of manure about 900,000 pounds, or 450 tons. Estimating each load of manure "ridden" from the stables at about 1000 pounds weight, we find that on this basis about 900 loads daily are removed from the city. The fact is, however, that the nearer amount is about 1200 loads daily, irrespective of the weight of a single load.

The close association of the owners of horses with these animals is the excuse for making now a change of statement by considering the owners themselves as the practical producers of this product. The owners of these animals can be separated into certain definite and well-recognized divisions, for the purposes of the remarks that are to follow: (1) Persons of leisure, to whom the horses are but another means of pleasure and enjoyment; (2) persons engaged in business in which these animals are employed as an aid, convenience, or necessity; (3) the poor men who, by thrift alone, secure to themselves the ownership of one or two horses, upon the proceeds of the direct use of which they themselves and their families depend for livelihood and support. The horses of the first class are kept in private stables and in first-class boarding-stables, the expense in the latter instance being from $25 to $35 a month for each horse. Those of the second class are also kept, as a rule, in boarding-stables, but of a less pretentious character than the former. In this instance the expense

varies from $20 to $30 a month for each horse. The horses of the third class are kept either on the premises occupied by the owners and their families for living purposes, or in stables of a humbler class, opening into alleys, lanes, and yards. From $14 to $20 a month for each horse is a fair estimate of the cost of stabling in the places last mentioned. The manure is removed from all the stables in the same manner—that is, in carts, at specified intervals, for a stipulated compensation. The stipulation prices for removal vary from $1 to $12 *per annum* for each horse. In a fair percentage of instances (twenty-five) the manure produced by the humblest class of owners is removed by the manure "riders" without charge.

It is of special interest at this time to note the fact that, when the horses are stabled on the living premises of the owner, the wagons, carts, etc., are commonly parked in the street in front of the premises; but when the horses are aggregated in a common stable located elsewhere, the vehicles are then parked in the stable-yard and in the lane or alley adjoining the stable; sometimes, of course, in the street, as before. The sanitary advantages of the aggregation method of stabling horses are obvious at a glance, for by this plan the number of stables in the city are lessened, and their proximity to dwellings is reduced to a minimum; the parking of vehicles in the streets in front of human habitations is much diminished, together with the nuisances dependent on their presence in the streets.

The manure merchants or "riders" of manure are, as a rule, most estimable and law-abiding citizens. In many instances the amount of money invested, as well as the energy and enterprise displayed by these men, is calculated to entitle them to the respect of those engaged in other and more fastidious occupations. It is the custom of those engaged in riding manure to make such terms with the producer as are mutual, as is elsewhere shown. The frequency of the removal of manure depends on the amount made and the ability to properly store it on the premises, etc., together with the interruptions dependent on the exigencies of the weather. It is important to notice the manner of removal. It is forked from the manure vault or pit to the floor of the stable, or the sidewalk, or into the cart, as best suits the convenience or

fancy of the laborer engaged in the work. The time occupied in the transfer from the pit to the cart is from thirty to forty-five minutes for each load. Always one and sometimes two laborers are engaged with each cart, the number depending, of course, on the difficulties of loading, as modified by the size, shape, and situation of the manure vault. The loads of manure are drawn through the streets to a "dump" at the river front, where the manure is transferred, directly or indirectly, to a scow for removal from the city.

The markedly unsavory nuisances that are unavoidably associated now with this branch of the business are caused, first, by the storage and handling of loose manure on the premises, causing odors in and about the stable building which taint the textile fabrics of the carriages and of the occupants of the stables, and it is asserted by some that even the varnish of the carriages is tarnished and often permanently disfigured. The escape of these offensive odors into the external air annoys the passers-by and also the occupants of the contiguous dwellings. Second, the streets are littered by the falling of manure and straw from the carts while *en route* to the "dump," and often the offensive odors of manure are plainly discernible in the streets through which the loaded carts are passing. Third, the dumping or unloading of the manure at the docks is complained of by many as being offensive to the sense of smell and by all as offensive to sight. The collection and the removal of manure to the scows that transport it from the city requires, as before remarked, a considerable outlay of money, together with much energy and enterprise. Thus employment is furnished to about four hundred laborers (396). These men receive each about $1.75 *per diem* for services. Nearly three hundred carts (296) of all sizes, mostly single, are employed for the purpose. Each horse and cart hauls from two to six loads a day, the number depending on the distance drawn and the convenience of handling. The great majority (226) of the carts haul five loads in a day. It now becomes a comparatively easy matter to estimate approximately the amount invested in this business directly, together with the amount paid for labor to establish the practical application of it. The four hundred (396) laborers earn about $1.75 each *per diem*, which earning (about $207,900 *per annum*)

forms the principal item, no doubt, of the annual support of three times that number of persons. The three hundred (292) horses can be safely estimated as costing $200 each, or a total of $60,000. The carts (296) cost about $113 each, making a total of $33,448 for these vehicles. Three hundred (292) sets of harness, estimated at $38 per set, add $11,400 more to the outlay. The expense of shoeing the horses, wear and tear of the vehicles and harness, etc., cannot be less than $7500 or $8000 per annum additional—making a grand total of about $320,000, including the yearly wages paid for help. If to this amount be now added the yearly expense incurred for the leases of premises for "dumps" and for emergency storage, this total will be increased much more. The expense of scows, if they be owned by the manure merchants, or the expense of the hire of them if they be not, becomes a fixed matter under any system of action, since they are loaded to the fullest capacity at all times. It is reported that from twenty-four to forty-eight hours elapse from the time of the removal of the manure from the stables of the city before it is sold by the "rider," or stored by him outside the city limits for the purpose of "ripening" for sale. Long Island, New Jersey, and Westchester County furnish the principal markets of disposal.

The consumers of this manure are those who till the soil, and they reside principally in the parts of the country contiguous to the city, as just indicated. They receive the product in the form of bales, or in the loose state, as the occasion demands or their fancy directs. As yet, but a comparatively small amount of manure is baled.

In considering the question of the policy of baling manure, it seems proper that the subject should be divided into three distinct parts: (1) The baling itself; (2) the handling after baling; (3) the effect of baling on the fertilizing qualities of manure. The last of these divisions will be considered first. This division directly interests the consumers of manure. They will naturally inquire as to the effect of baling on the fertilizing powers of the product. If it shall appear that manure, when baled, is as serviceable as when unbaled, then, certainly, no reasonable objections to baling can be urged by the tillers of the soil; on the contrary, they should welcome the change as one that facilitates their labor, and consequently adds to their per-

sonal comfort. As to the effects of baling on the fertilizing properties, it is not necessary to theorize at all, since the science of chemistry can settle the fact beyond dispute.

The following report of the comparative analysis of baled and unbaled manure, made by Mr. E. W. Martin, Chemist of the Board, speaks not only for itself, but also for the committee, regarding the matter :

NEW YORK, June 15, 1889.

E. H. JANES, M.D., *Assistant Sanitary Superintendent :*

SIR : I have the honor to make the following report with regard to changes in the commercial value of horse manure through baling the same. The method of analysis employed was that recommended by the Association of Official Agricultural Chemists, Washington, 1888.

First Set of Experiments.—One bale of manure, put up at the stable of the New York Cab Company, Forty-fifth Street and Fifth Avenue, and a quantity of the same manure, unbaled, were sent to the disinfecting station at the foot of East Sixteenth Street on March 28th, 1889, and kept under cover.

Samples of the above specified manure were taken and analyzed by Assistant Chemist Beebe on May 3d, 1889, with the following results :

Analysis Number.	Character of Sample.	Ammonia on Dry Basis.	Total Phosphoric Acid on Dry Basis.	Insoluble Phosphoric Acid on Dry Basis.	Moisture.	Remarks.
		Per Ct.	Per Ct.	Per Ct.	Per Ct.	
5,867	Unbaled manure.....	2.55	1.54	0.26	51.73	Very slightly molded.
5,869	Baled manure.....	2.44	1.40	0.25	50 82	Completely molded ; "fire-fanged."

Second Set of Experiments.—Two bales of manure, put up at the same place as in the first experiment, together with loose manure, were taken to the disinfecting station on May 8th, 1889, and treated as follows :

Loose manure inside.

One bale exposed to weather outside.

One bale inside.

Samples of the above specified manure were taken and analyzed by Assistant Chemist Beebe on June 4th, 1889, with the following results :

Analysis Number.	Character of Sample.	Ammonia on Dry Basis.	Total Phosphoric Acid on Dry Basis.	Insoluble Phosphoric Acid on Dry Basis.	Moisture.	Remarks.
		Per Ct.	Per Ct.	Per Ct.	Per Ct.	
5,891	Loose manure inside.	2.72	1.68	0.21	49.64	Molded.
5,892	Bale exposed outside.	3.10	1.83	0.21	44.80	Molded completely from centre out—still warm.
5,893	Bale inside.....	3.07	1.64	0.17	31.17	Molded completely ; cold.

From the above-given results, I am of the opinion that the baling of horse manure and keeping in bales for thirty days does not injure its commercial value, nor is there reason to believe that baling for a longer period than this will lessen the commercial value.

Respectfully submitted,

[Signed.] EDWARD W. MARTIN, *Chemist.*

This report has been examined by so eminent an authority on chemical and sanitary matters as Professor Charles F. Chandler, of Columbia College, and a former president of this department. In a communication to me regarding this report, Professor Chandler says :

SCHOOL OF MINES, COLUMBIA COLLEGE,
Corner Forty-ninth Street and Fourth Avenue,
NEW YORK, August 22, 1889.

DEAR DR. BRYANT : The manure question has always been one which has been a source of a great deal of discussion and difficulty. It came up every year while I was connected with the Health Department, and no plan was every proposed that gave satisfaction to all concerned. When the subject of baling manure was first suggested it struck me favorably, and I visited the yard on the East River where the process was being carried on, and it seemed to leave nothing to be desired in the way of simplifying the handling of the material. It

was suggested by some parties that the fertilizing properties of the manure would be injured by the process, but I was satisfied at once, without making any analysis, that this could not be true. The manure was not wet enough to have anything squeezed out of it in the process of baling, consequently it could lose nothing in this way, and there was no more reason for its losing valuable fertilizing constituents in baling than in rotting. I am glad to find that the very complete analyses which have been made by Mr. Edward W. Martin, your chemist, and his assistant, Mr. Beebe, entirely confirm this opinion, and show that the manure suffers no loss by the baling process. There is no reason why it should. I cannot think of any suggestion to make beyond what I have said in favor of baling. I hope you will insist upon this process; it is the only radical improvement that I can think of in this connection.

Very respectfully yours,

[Signed.] C. F. CHANDLER.

Professor Maurice Perkins, Professor of Chemistry of Union College at Schenectady, a member of the State Board of Health, in a verbal communication to me, confirms all the above-named gentlemen have said. It is surely a supererogation to seek further facts in the matter in face of the positive statements of these eminent and distinguished scientific gentlemen.

The molded or "fire-fanged" appearance of baled manure naturally excites doubt in the minds of the consumers as to the integrity of the fertilizing qualities. This doubt, too, is settled by the analysis of "fire-fanged" manure made by Mr. Martin, as will be seen in his report. It is the opinion of the Committee that no good reason exists why the consumers of manure should object more to the baling of manure than the consumers of hay object to the baling of that product. In fact, it appears to the Committee that the consumers ought to hail such a measure with delight for the following reasons: 1. Baled manure is more easily and rapidly handled than the unbaled, and the handling is attended with no offensive odors or defilement of vehicles. 2. The fertilizing properties are not impaired by baling (see Martin's report), and, if necessary, it can be unbaled and "ripened" or combined with other

fertilizing agents more quickly, conveniently, and economically than when in the loose state. 3. Farmers who market their produce in the city can return home with a load of baled manure without causing any offence, and with a practical financial advantage to themselves.

Second: Handling after Baling.—This division of the subject directly concerns the manure merchants or "riders" of manure. It is perfectly fair to assume that these people, like other business people, will be pleased with a proposition that will enable them to attend to their business in a shorter time, and at less expense to themselves, than is now done, provided the market value of their labor be not impaired by the method adopted. That the fertilizing properties of manure are not impaired by baling is already irrevocably proved; and that the market value depends almost entirely on these properties cannot be denied. If, now, the properties be preserved, and at the same time the manure be presented to the consumer in a convenient, practical, and inoffensive form, then indeed should the market value be increased; certainly it cannot be diminished.

The business can be done in a shorter time for the following reasons: 1. A given amount of baled manure can be handled more quickly than the same amount of unbaled manure, and without any offence. The same is true, also, of baled and unbaled hay. 2. Heavier loads of baled manure can be drawn during the same length of time than of unbaled manure. Twice as much (weight) baled as unbaled hay can be easily drawn at a load; and there is no good reason for the belief that practically the same relation will not hold good in connection with manure. 3. As no offence is created by the drawing of baled manure, the time of drawing can be modified to conform to the recognized customs of other businesses.

Less Expense to Themselves.—1. If it be true that a greater amount of baled than unbaled manure can be handled in the same length of time, it follows logically that a lesser number of horses, carts, etc., will be required to accomplish the given purpose; consequently the expense of handling will be proportionately reduced. 2. If it be true that heavier loads of baled than unbaled manure can be drawn in the same length of time, then it follows undeniably that the expense of haul-

ing is lessened proportionately to the amount drawn. 3. If the relation between baled and unbaled hay, as regards the amount drawn in a given time, exists also between baled and unbaled manure, the expense of "riding" manure will be reduced at least one half by the baling process.

If, now, attention be directed to the amount invested by the manure merchants in horses, carts, harness, wear and tear, etc., it is apparent that the gain for them, even with a less favorable estimate, will be immense, if compared with the amount now invested. It is well to notice also the probable fact that with this system bales of manure, like those of hay, can be marketed directly, thus doing away with the special cars, scows, sloops, dumps, etc., which are necessary on account of the offensive nature of the product while in the loose or unbaled state. These results will lessen the outlay of the manure merchants, thereby enabling them in turn to lighten the expense of it, as related to the producer and the consumer.

The baling itself affects those engaged in all phases of the manure business, and concerns indirectly also all classes of the community. It directly affects the pockets of the former, and indirectly concerns the senses of the latter, and, as a rule, the effect on the pockets is productive of the more potent results of the two. The securing of the apparatus to bale manure properly cannot in any way seriously incommode the first two divisions of persons mentioned in the beginning of this report —viz :

"Persons of leisure and of business, who own horses as aids to pleasure and profit." I will not, therefore, question the sincerity of their good citizenship by a further consideration of themselves in connection with this point ; they should be stanch supporters of whatever plan is shown to be productive of the greatest good to the greatest number.

How will the persons of the third division be affected by baling manure? It will be remembered that to this class belong :

"The poor men, to whom the proceeds of the use of one or two horses are the principal means of support of themselves and families." To expect each of them to make the outlay necessary to bale the manure of the horse or horses that be-

long to each is absurd and impossible of accomplishment; and, if it were possible, the requirement of it would be as unwise and unjust as it is burdensome, and as inconsistent as it is unnecessary. These persons should be permitted to put the manure in cheap barrels or other proper receptacles, in which it should be removed to the dump by the manure merchants, and the receptacles returned by them to the producer. The cost of this class of producers need be but little, if any, in excess for each horse of the price of the barrels—about $3.65 *per annum*, or one cent each day. It may be said that the manure merchant will not take the manure thus barrelled and return the barrels without extra expense to the producer. Let us look for a moment at this phase of the subject. The producer will purchase and fill the barrels. A barrel will cost not to exceed ten cents; it will contain the "droppings" of one horse for from seven to ten days, equal to about 100 to 150 pounds, according to the size of the barrel, including the stable straw that will naturally enter into it. The producer will willingly give the manure to the "rider" and will pay him from five to ten cents for the barrel when returned. It is shown that the average number of loads of unbaled manure drawn daily is five, each weighing from 1000 to 1500 pounds. We will select the lesser estimate. Each load will then represent ten barrels of manure, each barrel containing 100 pounds. At this figure the "rider" receives 5000 pounds of manure daily from the producers for nothing, and is paid for returned barrels $2.50 to $5 each day.

It is estimated that the gain in time of loading barrelled manure over forking loose manure into the cart will be substantially offset by the greater length of time taken to empty the manure from the barrels at the dump. Surely the manure merchants, who will gain so much from handling baled manure, can well afford to remove the barrelled manure, even if they themselves furnished the barrels and return them. It is an enterprise, surely, that many, independent of the manure merchants, would grasp at once, to say nothing of the farmers, who would return from the city with manure after having marketed their products. There is no doubt that many worthy and enterprising persons would appear at once who would gladly accept the opportunity to remove the manure inoffen-

sively for the modest remuneration that would follow. Not a thing is wasted in this city, except by those who do not need it, or those who do not appreciate its value. The same enterprise that gathers rags from the gutters will satisfactorily solve this element of the subject. In view of these facts, and the demand of the people of this city for relief from the foul and offensive odors that constantly arise as the result of the present method of handling, the committee respectfully recommend that the Sanitary Code be so amended as to conform to the spirit and purpose of the following resolution :

Resolved, That on and after the fifteenth day of May, 1890, it shall not be lawful to remove stable manure from any stable or premises in the built-up portion of the city of New York, or to cart the same within the city limits, without a permit from the Health Department, unless the manure be pressed and baled as required by the Board of Health, and be properly covered while being removed and carted, or be inclosed in tightly covered barrels or receptacles approved by the Board of Health, so as to prevent the escape of all offensive odors and liquid matter.

Respectfully submitted,

[Signed.] JOSEPH D. BRYANT, M.D., *Chairman*,
WILLIAM M. SMITH, M.D.

Since the organization of the Health Department in 1866, there have been from time to time changes and improvements in the methods of caring for manure in stables and its removal therefrom. The sanitary ordinances upon the subject, adopted in April, 1866, required that manure should be removed daily from stables to some proper place ; that the stables and stable-yards should be kept in a cleanly and wholesome condition, and that no pile or deposit of manure should be made within the built-up portions of the city without a permit from the Board of Health.

In the Sanitary Code, as readopted under the charter of 1870, there was an additional provision that stable straw used for bedding should not be placed or dried upon any street or sidewalk or the roof of any building. Under the charter of 1873 the Sanitary Code as adopted provided that manure and refuse of stables should not be allowed to remain on any street or place between the hours of eight o'clock A.M. and six o'clock P.M. ; that the removals of manure from stables should

not be made within those hours. It also provided that every stable should have an underground and properly covered manure vault of not less than sixty-four cubic feet capacity. On November 30th, 1875, the ordinances were amended, prohibiting the handling of manure between the hours of ten o'clock A.M. and six o'clock P.M., and requiring an adequate and properly covered manure vault, but not requiring that it should be underground. On June 22d, 1880, the ordinance relating to manure was amended, prohibiting removal between eight o'clock A.M. and eleven o'clock P.M., and requiring underground and properly covered manure vaults. On March 15th, 1887, the section relating to manure was so amended as to require that " whenever there shall be a cartload of manure on any premises it shall be immediately removed unless it be pressed or baled ;" and that no manure vault under the sidewalk shall be built or used, and that no manure vault or receptacle outside of the stable shall be built or used on any premises except by a permit from the Health Department. On July 30th, 1889, the ordinance relating to manure was amended, preventing manure from remaining on the street, or any removal at any hour without a permit from the Board of Health. This ordinance was further amended July 8th, 1890, requiring that whenever a cartload of unbaled manure accumulates on any premises, the carts or wagons shall be loaded within the premises and not upon the street or sidewalk, and that a permit from the Board of Health shall be required to remove manure from any stable or premises, or to cart the same unless the manure is pressed or baled ; that all wagons used in this business shall be tightly covered and of a construction approved by the Board of Health. It also required that all manure, when transported through the streets, must be covered and secured so as to prevent offensive odors escaping and dripping upon the streets ; that bales, barrels, or other receptacles of manure shall not be opened until they reach the dock designated for removal from the city, and that manure, when baled, shall be removed within ten days.

During the week ending February 16th, 1895, a careful investigation was made of all of the stables in the city of New York south of the Harlem River, with a view of determining not only the exact number of stables and horses, but to ascer-

tain what improvement had been made in the handling of manure since the adoption of the amendment of July 8th, 1890.

It was found that there were 4386 stables and 69,212 horses.

Manure disposal was as follows: In covered carts, 3659; in barrels, 591; in bales, 6; by burning, 33; for fertilizing ground in city, 91.

That of the stables having from one to five horses—viz., 2021 with 6023 horses, 406 stables with 1082 horses, or about 18 per cent, are now (February 16th, 1895) barrelling.

SECTION 100. That every owner, lessee, tenant, and occupant of any stall, stable, or apartment, in which any horse, cattle or swine, or any other animal shall be kept, or of any place in which manure or any liquid discharge of such animals shall collect or accumulate within the built-up portion of said city, shall cause said liquid and manure to be at once removed to some proper place, and shall at all times keep or cause to be kept such stalls, stables, and apartments, and the drainage, yard and appurtenances thereof in a clean and wholesome condition, so that no offensive smell detrimental to health shall be allowed to escape therefrom.

AMENDMENT:

On and after the first day of June, 1895, *it shall be the duty of every person or persons, company or corporation, keeping a horse or horses, a mule or mules in any yard or stable in that portion of the city of New York which is situated south of the Harlem River, to cause all manure dropped by such animal or animals to be removed from the floor of such yard or stable at least once in every twenty-four hours, and cause the same to be immediately pressed in bales or barrels within the premises. The pressure required may be applied by placing such manure in a baling press or barrels, and reducing the same to at least one third of its original bulk. The baled or barrelled manure shall be removed every ten days, or sooner if required by the Board of Health. It shall not be lawful to remove manure from any stable or premises, or to cart the same through the streets of the city of New York south of the Harlem River without a permit from the Board of Health, and unless the manure is pressed in bales or barrels in a manner satisfactory to the Board of Health.*

Every such cart or wagon must have a permit in writing from the Board of Health, and be used in accordance with the conditions of such permit, and not otherwise. The bales *or* barrels above mentioned shall not be opened within the city limits except upon the conditions of a permit in writing from the Board of Health, and *then only* at such docks or places remote from dwellings as shall be approved of by the Board of Health, and to which a permit in writing for such use shall have been previously granted by the Board of Health.

No manure shall be allowed to be thrown upon or to fall or remain in any street, sidewalk, or ground near such stable. No manure vault under the sidewalk shall be built or used. No manure vault or receptacle outside of a stable shall be built or used on any premises except pursuant to the terms of a permit granted therefor by the Health Department.

TWO ESTIMATES ON THE COST OF PUTTING SCHOOLS IN SANITARY SHAPE.—At the Academy of Medicine, February 15th, ex-School Commissioner Charles C. Wehrum read a paper on "How Can the Sanitary Conditions of the Public Schools be Improved?" He said that it would require $7,000,000 to put the public schools of the city in the condition they ought to be.

President of the Board of Education Thomas Knox, who was invited to be present, sent in his stead Assistant Superintendent of Schools Lee, who commented on the several papers read. In his opinion it would take three times $7,000,000 to put the schools in the sanitary condition they should be in.

Dr. Moreau Morris, for the Health Department, made a general inspection between December 26th and January 12th of the public schools reported on by Commissioner Wehrum in April last. He reported on thirteen primary schoolhouses and thirty grammar schoolhouses. In about one half of these cases he found that the worst abuses—those resulting from defective or bad plumbing—had been remedied so far as, with the situation of the buildings, it was possible to remedy them. But he was still forced to make statements of actual conditions which cannot be read by any decently sensitive citizen of New York without disgust and humiliation.

HOW TO BURN AND HOW TO SAVE GAS.

ABSTRACT OF AN ADDRESS BY W. R. HERRING, MANAGER OF THE HUDDERSFIELD GAS WORKS, ENGLAND.*

THOUGH candles were used in the earliest days of Roman history, and though wax was extensively employed for illumination during the Middle Ages, it was not until the fifteenth century that candles were brought into general use, and it was not until the eighteenth century that the plan was invented of casting candles in moulds. Lamps were of very ancient date, being frequently mentioned in the sacred writings, and there was no doubt that they were much better known and more generally used than candles. Though they were little known in Greece, they were common in Rome in the early period of her history, and the light from them was produced from vegetable oil, and a wick burning without a chimney or shade. Little improvement was made in lamps until modern times, when M. Argand, of Geneva, effected a complete change in the art of illumination, producing a lamp which had a hollow cylindrical wick and a glass chimney which surrounded the flame, the chimney drawing a large current of air through the central hollow part of it. Few improvements of any practical importance had been made on this principle, notwithstanding that many contrivances had been originated and various combustibles resorted to.

Gas was now the universal artificial illuminant. It was known to exist in the earliest ages, being generated in the great laboratory of nature by the action of artificial heat on accumulations of vegetable matter, such as beds of coal, the products of this action making their way to the surface of the earth, and escaping in the form of gas and oil. Though in 1659 a Rev. Dr. Clayton distilled pit coal obtained in the Wigan District, obtaining a spirit which burned, and which was no doubt coal gas, it was not until 1792 that William Murdoch, an ingenious engineer of Cornwall, discovered a

* From *American Gas Light Journal*, February 4th, 1895.

practical method of making gas, and applied it to the lighting of his own house. Later he joined Messrs. Boulton & Watt, of Soho, Birmingham, and at the Peace of Amiens, in 1802, their factory was lit up for the first time with gas, and two years later several large cotton mills in Lancashire were lighted by Murdoch with gas. Nine years later the manufacture of gas had extended to London, and the year following the old oil lamps were removed from Westminster, and the streets lighted with coal gas.

After dealing briefly with the electric light, which he said did not appear so far to have affected the demand for gas, he remarked that there was a constant demand for more light, and that which a few years ago was regarded as sufficient was not now so regarded, and the problem was how this increase of light could be secured without also increasing the cost. Assuming that the same amount of gas was capable of yielding more light, what were the causes which prevented consumers generally from having satisfactory lighting in houses? The fault rested in the majority of cases with the gas burners being old or unscientific in principle, or it might be that the distributing pipes in the houses were insufficient in size or were choked by corrosion, so that it was impossible to get a sufficient supply of gas, or it might also be that the meter might be defective, causing temporary inconvenience, and a very general cause productive of defective meters was overwork, the works being so delicate that overwork soon told its tale.

Mr. Herring proceeded to explain the difference between wet and dry meters, and also the method of detecting leaks by the meter. He showed that mixing from 1 to 5 per cent of air to gas was detrimental, because it would reduce the light, and that if that percentage was increased it became highly dangerous up to 15 per cent, as it made an explosive mixture; but if a still greater amount of air was added it produced what was known as the Bunsen flame, which was practically the basis of all varieties of gas cooking and heating stoves; and while this method of using gas was fast gaining in popularity, it was, comparatively speaking, a new application for its use, by far the greater quantity of the gas made being used for illuminating purposes. By means of experiments,

he showed the nature of gas-light, and pointed out that to get the greatest amount of light from the gas it was necessary to burn it in small jets—Argand burner—or to distribute it in a thin sheet, so that the atmosphere could come into proper contact with the issuing gas through the gas burner.

He described the Argand burner, and the air supply, which was regulated by the chimney, and said that in order that the thin sheet of flame might be of proper form and size it was absolutely necessary that the gas should issue from the burner at a fixed pressure, any alteration of which must of necessity alter the appearance of the flame, as well as the quantity of gas passing. Herein lay the secret of efficient gas lighting.

Again by experiment he showed that the rate at which the gas issued from the burner had a direct influence upon the amount of light and consumption of gas. The lower the pressure consistent with the giving of a properly shaped flame the better the light, and the less would be the consumption. For this reason, in practice the slit burner gave better results than the union jet, as it was easier to see when an excess of gas was passing the slit burner than the jet ; but if the slit burner were allowed to become dirty, or the proper material was not used in making it, the surface became roughened, and offered resistance to the passage of the gas, causing a diminished lighting effect. Recently a burner cap had been introduced which illustrated conclusively this effect of pressure upon the lighting—and it was made to fit over an ordinary union jet burner. When the cap was placed over the burner there was a better light, because it enabled the gas to be burned properly and at a lower pressure ; but it only temporarily overcame a defect which should not exist, for in time this cap would become defective, and require one put over it. On the contrary, if they had a proper governor burner put on at the outset, it would last a lifetime by occasionally renewing the steatite tip, and they could always insure the gas burning at its proper pressure and quantity. The caps did not cause less gas to be consumed, but they gave a better light for the same quantity, and the numbers of the burners were no indication of the consumption per hour, excepting in the case of governor-burners.

It was a very common complaint to hear people speak of

bad smells and dirty ceilings in gas-lighted rooms, and there was no wonder when bad burners were used. The surprise was that the death-rate was so low, for bad smells and dirty ceilings simply arose from partly consumed hydrocarbon gases passing into the room, vitiating the atmosphere far more than if the same quantity of gas was used by burning it in proper burners, yielding proper combustion, and far more light. Dirty ceilings, and the spoiling of decorations, which were chiefly attributed to this cause, could never be entirely prevented, but coal gas was not responsible for them when the gas was properly burnt. Hot water pipes, and even electric lamps, caused the same effect in their vicinity, and thus, through the extra heat in the atmosphere, particles of dust were blown about and came in contact with anything in the immediate neighborhood of the heating medium. If the gas supply was imperfectly purified the sulphur therein greatly aggravated the dirtying of ceilings and destruction of decorations, and therefore the proper purification of the gas was the first duty of the suppliers of gas who recognized their duty to the public. It might be said that the darkening of ceilings and decorations was in direct proportion to the amount of dirt particles in the atmosphere, combined with the efficiency of the gas burner.

The general conditions affecting the supply of gas to a large and hilly town such as Huddersfield rendered it impossible for the gas to be distributed from the point of supply at such a pressure as to be suited for all consumers. The suppliers of gas, in their own interests, kept the pressure of gas as low as was consistent with the local circumstances; but this of necessity must be higher than was necessary for the gas-burners. It must force its way through (as in our own case some 250 miles of pipes), and also work the meters. Therefore, consumers had to govern the pressure for themselves, and the best and most satisfactory way of doing that was to use governor burners. In large mills and business premises a form of governor was sometimes applied to the leading pipe from the meter, but as gas increased in pressure in rising from floor to floor, difficulties arose in making an equal pressure throughout, and any such form of governor was useless if proper burners were not also used in conjunction with it.

Mr. Herring then proceeded to show how a good light might be depreciated by the use of an improper globe, and he pointed out that in the selection of a globe the important point was that the opening at the bottom must not be less than the width of the flame. Let them not hesitate to buy such globes because they necessitated larger galleries. A governor burner, gallery, and globe of the very best quality only cost from 12½ cents to 25 cents. He pointed out that white globes were the best, because they did not absorb so much of the light.

Mr. Herring then referred to the latest development of gas lighting—namely, the incandescent light—and he described how the light was produced.

The consumption of gas by these burners depended upon the pressure, the same as in all burners, and beyond a pressure of 15-10ths it became noisy, and warned one of the fact of excessive consumption. He found that a "Class C" burner at the above pressure passed 4.775 cubic feet of gas, and gave a light of 89.465 candles, or 18.73 per foot of gas, this being about five times as great as the same gas yielded when burnt in a standard Argand burner at 5 feet per hour. He gave a table showing the consumption of gas at various pressures with a "Class C" burner, and said that, as far as lighting went, the best results were obtained when the pressure was at 15-10ths, for anything above that was non-effective, and even detrimental. On the other hand, a decrease of light was also noticeable with the lesser pressures, and consequently smaller consumptions. He was not, however, prepared to advise them to use these burners at 15-10ths, as probably the consumption of gas resulting from this pressure would depreciate the mantle in greater proportion than a consumption at from 9 to 12-10ths. The fact of having these burners was no guarantee as to the consumption of gas, as this depended entirely on the pressure in the pipes. If the suppliers of this class of burner were wise they would, in their own interests, attach a governor to each burner, to pass, say, 3½ to 4 feet of gas per hour—in fact, purchasers should insist upon it, the price charged being sufficient to cover it. With ordinary intelligent care there was no reason why this system should not be adopted very largely for all lighting purposes except where

the burner would be subjected to much vibration or draughts, which were detrimental to the life of the mantle, which was very fragile, but not so much as to prevent its adoption, especially when the saving in gas more than compensated for the renewal of many in a year, to say nothing about the improved lighting. He expressed the opinion that this system would have a very serious influence on the adoption of the electric light, and in London it was displacing it, simply on the question of cost, being so much less than the electric light.

He gave a comparison of the cost of lighting by electricity, coal gas, and the incandescent light, on the basis of a consumption of 5 cubic feet per hour of coal gas, showing that ordinary gas was two and one half times less than the electric light in cost, and the comparison was in favor of the incandescent light.

OLD-FASHIONED NURSING METHODS.—"The difference between the old and new schools of nursing is even more marked than that between the modern system of medicine and that in vogue in the days of our grandfathers," said Dr. Pulser at the club the other evening. "Perhaps you will understand this better if I tell you a bit of my experience in the matter. This morning I visited a patient who had a trained nurse. On my arrival I inspected the chart, which had been carefully filled in by the nurse, giving me all the information I could desire about the sick woman's pulse, temperature, respiration, etc., taken at regular and frequent intervals during the night. By Jove! she had almost put down every time the woman had breathed. At once I knew as much about the case as if I had never left the bedside for a moment. After that I went to another house where they had a nurse of the old-fashioned family sort. Here, of course, I had no written details to guide me, and had to resort to cross-questioning the nurse. Her replies were rather hazy and unsatisfactory, until I asked whether the patient had slept well during the night. 'Oh, yes, doctor, I guess she must have,' said the nurse amiably; 'she didn't wake me up!'"—*Life.*

THE LONG ISLAND WATER BASIN—BROOKLYN'S RESERVOIR.*

By A. N. Bell, A.M., M.D.

Long Island lies between Long Island Sound and the Atlantic Ocean north and south. Its length from the western end, washed by the East River and the Upper Bay of New York, to Montauk Point, the eastern extremity, is 118½ statute miles, and its greatest breadth 23 statute miles; but there are numerous coves and small bays on both sides, which in several places leave less than half its greatest breadth between, insomuch that its average breadth is about 17 miles.

A ridge of hills, beginning with the site of Fort Hamilton, at the Narrows, comprising Bay Ridge, Brooklyn Heights, and continuously other hills of various altitude, extends all the way along the north side to Montauk. This ridge is commonly called the "backbone" of the island. The hills are almost wholly covered with luxuriant vegetation or fruitful crops seasonably, as are also the valleys between. The highest of them, Hempstead Harbor Hill, at Roslyn, is 384 feet above sea-level. Two or three others are nearly as high, and the terminal one at Montauk is 194 feet above the ocean. From the centre of this ridge—varying in distance from 100 rods or so to 2 or 3 miles from the north shore—the surface descends southward, about 20 feet to the mile, on the whole, but with some remarkable peculiarities.

There are numerous narrow depressions, all taking their rise in the hills and extending southward, appearing very much like the dry beds of once flowing streams. With rare exceptions they are never flooded, because the porosity of the soil is such as to rapidly take up all the rainfall. These depressions become more and more shallow and broader as they de-

* Read at the Montreal Meeting of the American Public Health Association, September, 1894. From the *Journal of the American Public Health Association*, January, 1895.

scend, until they are finally lost within a mile or two of the south shore, in the general expanse of an almost level plain. Along the margins of these otherwise dry beds, and at many places in the sandy plain where all traces of them are lost, there are outbreaks of water--not springs—from the surcharged subsoil; and from these outbreaks rise many beautiful rills, some of which swell into brooks of considerable size, all running toward the ocean.

Equally remarkable is the number of basin-like dales scattered here and there all over the island. Many of them hold water all the year round, and some of them are pretty lakelets of a mile square or more. These "ponds" have no outlets except the overflow into the sandy soil by which they are bound, and over which they never flow. The depth of some of them extends to the full depth of the soil saturation, and these consequently are never empty. The water they contain, the same as that which breaks out in many places on the plain, is remarkable for its purity.

The structure of Long Island is bowlder and bowlder drift ground to gravel and sand by waves of the ocean during the period of coast subsidence. The sand and gravel rest upon an impervious stratum of hardpan or blue clay of variable depth; from within a few feet of the surface in some places —which places are on that account unhealthful—to more than 70 feet in others, but with an average depth through the central part of the island of about 50 feet; and throughout, even in the dryest weather, this sand and gravel bed is loaded with pure water to within 25 feet of the surface—a vast sand-filtering reservoir, surpassing any which human ingenuity has ever contrived.

In the experimental and subsequent progress of the work for procuring the water supply of Garden City, fifteen to eighteen years ago, which fell under my personal observation, there was not a single particle of decayed or decaying organic matter of any kind discovered in the soil.

Garden City is situated at an elevation of 103 feet above sea-level, about midway between the shores of the Atlantic Ocean and Long Island Sound, 20 miles eastward from Brooklyn. In the process of sinking the well, the soil was found to be in layers, the beds having a dip southward. The depth of

the subsoil at that place was 70 feet, but from experiments roundabout there was reason to suppose that in some places it was much greater. By boring through the gravels and sand at the depth of 70 feet, a dense stratum of hardpan was encountered. Six miles nearer the ocean the depth of sand and gravel was found to be 68 feet, resting upon a bed of blue clay. This underlying stratum of hardpan, or blue clay, beginning in the hills, extends not only quite to the south shore, but doubtless at some distance under the ocean beach beyond. Wells sunk sufficiently deep into this sand and gravel are of exceptional purity and inexhaustible.

The well at Garden City is 50 feet in diameter; the surface of the water in it is commonly 25 feet below the general level of the plain; but it is located in one of the river-bed like depressions, 14 feet below the general surface, so that the depth of the well to the surface of the water is only 11 feet. The depth of the water is 20 feet, and rises from the bottom. No water gets in through the sides of the well, because they were rendered thoroughly impervious in the construction. The enormous volume and pressure of the water from the sand and gravel bed into which this well is sunk will be appreciated from the fact that, while it was in process of construction, four wrecking-pumps, discharging through pipes ten inches in diameter, were worked continuously day and night for a whole week, in order to keep the water sufficiently low to proceed with the wall. The water from this well is distributed by means of a Holly pump, adequate to discharge 3,000,000 gallons daily, and the supply is abundant.

At East Rockaway there is another well, similar to the one at Garden City, which by means of pump and pipe supplies Long Beach, 2 miles distant. This well is 38 feet in diameter, but only 20 feet deep. It is sunk from the level of the plain, only 10 feet above the tide-level of the salt creek and marsh, but 20 rods distant. Yet the water, like that of the well at Garden City, is remarkable for its purity, and has never been known to possess the least brackishness. The average daily delivery is 200,000 gallons, but 500,000 gallons could be supplied if necessary without any danger of exhausting the supply. The depth of water in this well during eighteen years since it was sunk has never been less than 6 feet.

From the fact that the level of soil saturation, as discovered at Garden City, in the central portion of the island, is many feet above tide-water, there occurs a ceaseless flow of the subsoil water from the "backbone" toward the seashore, not in the form of a subterranean stream or river, but in entire mass filtering through sand and gravel; slow, indeed, but continuous, found by actual observation over a wide area to move at the rate of from 8 to 12 feet daily.

The annual average rainfall over Long Island is 43 inches. It has been estimated that three fourths of this sinks into the soil. The surface waste is very small; indeed, there is scarcely any except in winter when and where the ground is frozen. It is certain, therefore, that the entire volume of the rainfall, excepting this small waste in the winter time and that which is lifted by evaporation or absorbed by vegetation, is carried by the soil.

Forty-three inches of rainfall is more than $3\frac{1}{2}$ cubic feet upon a square foot of surface. For convenience of calculation let us assume that 3 feet sink into the soil. This would give more than 83,000,000 of cubic feet to the square mile, or 2,500,000 tons. A freight car will carry 10 tons. Two hundred and fifty thousand cars, therefore, would be required to convey the rainfall upon *one* square mile in a year.

The whole surface area computed is about 2000 square miles. One half of this area at least would fall within the most favorable conditions described; hence it is quite safe to estimate the size of this reservoir to be 1000 square miles, with an average depth of 50 feet. This is Brooklyn's reservoir—the primary source of her water supply. The "ponds" are intermediary, mere convenient holds that have been utilized.

While the waste of streams is enormous, it is nevertheless, from a knowledge of the conditions of the soil and the examples cited of the wells sunk into it, easy to appreciate the inexhaustible adequacy of the Long Island Water Basin to supply water sufficient to meet the demands of Brooklyn for all time, and the folly of those who would in the face of such knowledge seek it elsewhere.

ALCOHOLISM AND "GOLD CURES."

Paper read by J. A. TANNER, M.D., and discussion of the subject at the meeting of the Norfolk District of the Massachusetts Medical Society, Boston, January, 1894.

IT seems strange that man only, of the entire animal creation, should be given to the use and abuse of alcohol as present in one form or another of beverage; but when we consider that alcohol does not occur in nature except in the decay of fruits, etc., being exclusively an artificial product, the freedom from the use of this substance by the lower animals appears as a forced necessity; otherwise the unreasoning beast might become more beastly even than the reasoning man from the use of it. Only two processes are known by which alcohol can be produced, and but one of these—the fermentation process—is generally practicable; yet man, from the lowest savage to the most civilized almost the world over, has managed to manufacture some form of intoxicating beverage in order to satisfy what seems to be a natural craving.

Whatever the beverage used to exhilarate, ethyl alcohol is the substance sought; and here we have two classes of

Alcoholic beverages	Fermented	Alcohol from sugar (wine, cider, etc.).
		Alcohol from starch (beer, ale, etc.).
	Distilled	Brandy, whiskey, rum, etc.

In the first class of fermented beverages grape sugar is the source, as found in the fruits; and there is scarcely a fruit known, even to the refreshing orange, that has not been made to yield a wine that would make drunk the user; and not satisfied with the mild, intoxicating effect given by the wine produced by partial fermentation, by means of full fermentation and distillation, in order to concentrate the alcohol, the stronger and more fiery brandies are produced, each with a flavor and action according to the fruit used.

In the second class of fermented beverages, where starch, as found in the cereals, especially rye, barley, and wheat, is used as the source, the milder and somewhat nutritious intoxicating beverages, as beer, ale, malt extracts, etc., are produced. Pushing the fermentation of the cereals to the full extent, in order to convert the starch entirely to alcohol, and

then concentrating by distillation, whiskey becomes the product; corn, with a small amount of rye or barley or wheat, giving Bourbon; rye, with a slight mixture of other cereals, to give rye whiskey, etc.; the various whiskeys obtaining the flavors according to the mixture of materials and the care used in malting and distilling. It will be well to say here that new and cheaply made whiskeys are especially destructive to the consumer, owing to the presence of the higher alcohols, especially amylic alcohol, generally known as fusel-oil.

When cane sugar, as found in the juice of the sugarcane, in molasses, ordinary sugar, or the skimmings from the boiling syrup in making sugar, is fermented and distilled, rum is the result. From the works of explorers we find that the savage in nearly every part of the world has some form of intoxicating drink, and often an ingenuity is shown in the selection of the material and method of manufacture worthy of a skilled chemist. Before the time of Cortez, the natives of Mexico used the sap from the so-called century plant to produce the national drink of the country, known to-day as pulque. In some of the distant cannibal islands of the Pacific a root containing starch was used, the process being started by first chewing the root, thus mixing the saliva with the starch in order to start the necessary change of the starch to grape sugar, in order to have fermentation. According to the steady user of intoxicating drinks, there is nothing so bracing and warming as a good large "drink" upon a real cold day; then nature in its economy has made a sad and grievous error, for the Esquimaux, inhabiting the cold and bleak Arctic regions, had no drink of an intoxicating nature before the advent of the civilized merchant, and, stranger still, nature does not give sufficient vegetation containing starch or sugar for them to make such a drink.

The hardy explorers of these cold regions tell us that alcoholic stimulants reduce the stamina of the system and render it incapable of resisting the cold, so nature has here shown its unerring wisdom in withholding even the *chance* for stimulants, and so facts prove; for the advent of the strong stimulants of civilization has made great havoc with the natives, even greater than with those of warm climates. Dr. Hayes, the explorer, says, "While fresh animal food, and especially fat,

is absolutely essential to the inhabitants and travellers in Arctic countries, alcohol is, in almost any shape, not only completely useless, but positively injurious. Circumstances may occur under which its administration seems necessary—such, for instance, as great prostration from long-continued exposure and exertion, or from getting wet; but then it should be avoided, if possible, for the succeeding reaction is always to be dreaded; and if a place of safety is not near at hand, the immediate danger is only temporarily guarded against, and becomes finally greatly augmented by reason of decreased vitality. If given at all it should be in very small quantities, frequently repeated, and continued until a place of safety is reached. I have known the most unpleasant consequences to result from the injudicious use of whiskey for the purpose of temporary stimulation, and have also known strong, able-bodied men to have become utterly incapable of resisting cold in consequence of the long-continued use of alcoholic drinks."

The physical exertion to obtain food and the physical warmth to resist cold is very great for the natives of the Arctic regions, and the food supply is largely nitrogenous, with the hydrocarbons of an oily and fatty nature, with no starchy or saccharine hydrocarbons. On the other hand, the tropical inhabitants are furnished with an abundance of starch and especially sugar-producing foods, and, according to my observation, they stand the use of alcoholic stimulants far better than the inhabitants of the temperate regions (the region of starch-producing cereals) or the dwellers in Arctic climates. Especially do they stand well the use of the mild fermented drinks of their native manufacture. The exercise necessary to produce the necessities of life is reduced to the minimum, while the general temperature requires no special supply of heat-giving food to resist cold; hence, as alcohol may be ranked as a flash food, it probably to the natives of tropical regions does act as an artificial food supply. To give an explanation of this action of alcohol in cold and warm regions, Dr. Brunton will be quoted. He says:

"The action of alcohol upon the temperature seems to depend upon two factors. One of these is its power of lessening oxidation; but this only comes into consideration with large doses, when this factor may aid considerably in reducing

the temperature. The other factor is the dilatation of the vessels on the surface, which occurs even after moderate doses. This dilatation allows the warm blood from the interior of the body to circulate more readily near the surface, and thus subjects it to the cooling influence of the surrounding air, and also to the cooling effect of evaporation from the skin. By increasing the sweat it may lessen the temperature of the body even when that of the surrounding air is as high or higher than it, and it will also cool the blood by freer radiation when the temperature of the atmosphere is below that of the body. It is evident that the cooling effects of alcohol will thus depend to a great extent on the atmospheric conditions of temperature and moisture to which the person taking it is subjected, as well as on the quantity of alcohol. Normally, when a person is subjected to cold the vessels of the skin contract and prevent the warm blood in the interior of the body from approaching the surface and thus becoming cooled ; but when large quantities of alcohol are taken this mechanism becomes paralyzed, the blood from the interior circulates over the surface and is cooled down more and more, until its temperature becomes so much reduced as to be incompatible with life, and the patient is frozen to death."

The human race is specially prone to the use of stimulants in some form ; and from observation it can but be noted that the man who takes one drink of alcohol, or, I might say, the first drink, is more liable to the second, and so on ; as he proceeds the desire grows, until finally he meets with his first drunk, and then the second is more liable to occur, whatever his feelings or resolves may be, at once making a fool of himself. I can recall many occasional drinkers who have gradually become regular drinkers ; and some of the firmest and finest men I have known have allowed the habit to grow upon them so (in spite of strong wills and resolves) as to finally become night drunkards, while by day they could in a dazed manner attend to business or the duties of their calling. At first it is a matter of will to drink or not to drink ; but alcohol in the system has some influence over the physiological functions of the body, which sooner or later becomes stronger than the will, and then a pathological condition commences which to all intents and purpose fastens a disease upon the

drinker that requires more than the will can, and, in many cases, more than time and total abstinence can eradicate.

Now, if possible, an explanation of this insidious grasp of alcohol upon occasional indulgers in stimulants will be traced. One investigator (Dr. H. Ford, see H. C. Wood's "Therapeutics"), to demonstrate that alcohol must be oxidized in the body, worked upon the supposition that hepatic sugar is converted into alcohol before final destruction in the system, and sought by repeated distillations of large quantities of animal blood and various tissues to demonstrate the presence of alcohol. Without drawing upon figures, it is sufficient to state that he obtained alcohol from the blood and tissues, less being obtained from fresh liver tissue, and the greatest amount from putrescent liver tissue, in which the glycogen must have undergone fermentation. These experiments have not been confirmed by other observers, and no repetition has been made, but a strong corroboration is given by other investigators, who have found present in the urine even of total abstainers a substance resembling alcohol, and answering all the tests. One investigator (M. Bechamp), independently of the others, obtained from the urine of non-alcoholic drinkers alcohol in sufficient quantity to burn it; others have found that this substance exists in the urine of dogs, horses, lions, and rabbits. So the existence of this substance in the normal animal organism must be considered as proven. It is but fair to state that some assert that this substance is not alcohol; but when the actions and reactions given by it are the same as those given by alcohol, and no dissenter has shown that it is not alcohol, we must decide with the old lady who believed that the sausage which looked, tasted, and smelled like a sassenger was a sassenger.

Now, to go one step further, one investigator (Dupré, *Encyclopædia Britannica*), who found this substance (which we may safely call alcohol) present in the urine and perhaps in the breath of those who were teetotalers and those who had been abstainers for six weeks, points out an apparent connection with this substance and the ingestion of alcohol. "It was found that after the elimination due to the ingestion of alcohol had ceased, the amount of this substance eliminated in a given time at first remained below the quantity normally

excreted, and only gradually rose again to the normal standard."

May we not here look for a clew to the physiological action of alcohol, and the seductive and tenacious grasp it takes upon the being who once commences the use of it as a beverage; for, once taking it into the system, there is a disturbance in the important glycogenic function of the liver and a reduction of a normal and powerful constituent of the organism for some time, and to fill this want and properly carry out the physico-chemical actions there is a call for it, hence a desire, and finally the second drink is taken to give the supply, to again reduce the normal alcohol and the physiological production in the body; then a third call follows, this gentle action going on till finally other physiological changes commence, and the constant use follows, with effects as described in Flint's "Physiology." "The constant use of alcohol may create an apparent necessity for it, producing a condition in the system which must be regarded as pathological. The immediate effects of ingestion of a moderate quantity of alcohol continued for a few days are decided. It notably diminishes the exhalation of carbonic acid and the discharge of other excrementitious principles, particularly urea. These facts have been long since experimentally demonstrated. The proper amount of mental and physical exercise, tranquillity of the nervous system, and all circumstances which favor the vigorous nutrition and development of the organism physiologically increase rather than diminish; the amount of excretions correspondingly increase the demand for food, and, if continued, are of permanent benefit. Alcohol, on the other hand, diminishes the activity of nutrition. If its use be long continued, the assimilative powers of the system become so weakened that the proper amount of food cannot be appropriated, and alcohol is craved to supply a self-engendered want. The organism may in many instance be restored to its physiological condition by discontinuing the use of alcohol; but it is generally some time before the nutritive powers become active, and alcohol, meanwhile, seems absolutely necessary to existence."

Pushing the symptoms farther, Dr. T. L. Brunton will be quoted: "In persons who are accustomed to take an excessive quantity of alcoholic stimulants for a length of time,

although never sufficient to produce the symptoms of acute intoxication, alterations are produced in the digestive and nervous systems. One of the commonest evidences of the condition is vomiting of watery fluid in the morning immediately after rising. The bowels are rarely, if ever, constipated, being generally open three or four times daily. There is a tendency to fatty degeneration of various organs, the skin acquires a satiny feeling, and the capillaries on the surface of the face often become prominently dilated, giving a characteristic hue to the complexion, which is often especially marked upon the nose. The liver is apt to undergo fatty degeneration, and, at first, to be congested. Afterward the connective tissue becomes increased, the organ contracts, interfering with the circulation in the abdominal viscera and producing ascites. This may be complicated by cirrhosis of the kidney also. The nervous system may also be affected, the mental powers becoming impaired ; the temper at the same time frequently being irritable, while a tremulousness appears in the tongue, lips, and hands. When those accustomed to indulge freely in stimulants are attacked by acute disease, or when they receive injuries, or when, in consequence of a drinking bout, their stomachs are so deranged as to bring on loss of appetite and vomiting, and to lower their nutrition, they are liable to delirium tremens. So long as the drunkard is able to eat and digest his food he is less liable to this disease. As a rule delirium comes on in from two to four days after he has lost his appetite and begins to vomit. This delirium is marked by a peculiar tremor of the tongue, as well as of the limbs, and by delusions, which are especially connected with the sense of sight, the unfortunate patient imagining that he sees noxious animals crawling around him, or that he is plagued by demons, which are sometimes of a blue color, from which the disease is popularly known as 'blue devils.' The tongue is moist and covered with a thick fur. There is a loss of appetite and vomiting, which is often obstinate. The delirium is constant and active. It may become violent, and there is great restlessness and sleeplessness. It may gradually subside and the patient recover his health or a condition of mania ensue. Patients sometimes die suddenly without any warning symptoms."

The treatment of alcoholism at present by the medical pro-

fession in general is to guide the patient through the tremors or digestive derangements, give a tonic to build up the system, and advise him to brace up, be a man, and stop drinking. The advice is excellent if the patient comes into the hands of the physician early in the action, when the habit is not strong and some control of the will is left; but it is rare for the constant drinker to come for medical advice until he is threatened with delirium or the digestive troubles leading to it are present, when, except in very few cases, the will is too weak to brace up.

It would be a waste of time to mention or attempt to mention the many remedies, the numberless suggestions as to moral surroundings, etc., recommended for the cure of alcoholism; for nearly every physician has puzzled his brain for means to help the sufferer, and wound up with disgust at his good advice not being followed, and with surprise that the remedies so highly spoken of in his authorities do not work. It has been my misfortune to meet with many more cases of delirium tremens than I wished to, and the more I see of alcoholism in its various phases the more I feel convinced that we have yet to find the treatment for it. The treatment I have met the best success with has been by stopping all alcoholic stimulants and placing the patient immediately upon fifteen drops of OI. terebinthinæ with a teaspoonful of glycerine as a vehicle every two or three hours, watching the effect upon the kidneys and bladder. Turpentine acts as a stimulant, and for the time being takes away the taste for alcohol, while it soothes the stomach and bowels, so that nourishment can be taken; it also quiets the nerves, sleep following. Then a bitter tonic, such as cinchona, is given, and all the nourishment in a mild form that it is possible to get down. If sufficient sleep is not obtained, a small dose of Dover powder is given at bedtime. Failures have been met with when the turpentine was not given regularly or the patient was allowed to have alcohol. I have always felt that success would follow sooner or later when the patient could retain nourishment. I must admit that I am afraid of using opiates to any extent in these cases; and when a thirty-grain dose of chloral in several cases is known to have proved fatal, and even ten-grain doses given to the extent of eight doses in thirty-six hours nearly caused

death, I feel that it is decidedly unsafe to use it in the large and frequent doses generally advocated. For the ordinary alcoholic stomach with morning vomiting, where I could get the patient to ease up on his supply, following Dr. Ringer, I have found one or two drops of Fowler's solution, given in water about ten minutes before meals, to work quite well.

I will now speak of a treatment known to the profession by name, but not by a knowledge of the actual remedies used. I refer to the so-called "bichloride of gold cure," and it would be well to state here that it was to bring up a consideration of this treatment that one of the committee on papers asked me to write this article, being aware that I had an approximate knowledge of one of these "gold cures." While it is not my intention to defend or advocate the use of a secret remedy or remedies, I think the time has come, judging from the results, when we, as physicians, should stop pooh-poohing this treatment and endeavor to find out the nature of it, the good in it—if any—and use it accordingly.

Men I have talked with who have been through the treatment speak highly of it, and it hardly seems possible that such a large number would combine to form a "gold cure" club and wear badges as members of such a club unless they had received some benefit they are proud of. There have been many failures of course, and injury has resulted in many cases; but when the physical condition of many of the subjects is considered and the nature of the remedies taken into account, it is surprising that many more failures have not occurred and that more have not been injured in the rush of treatment there has been at one of these "cures." The claim is made that failure and injury would not follow with a careful selection of the subject and a careful watching of the action of the remedies.

In a friendly correspondence with the promoter of one system of treatment I am informed that no claim is made to entirely eradicate for all time all desire for alcoholic stimulants and place the patient so he will never drink again; but looking upon intemperance as a disease, by treatment they place the drinker, so far as alcohol is concerned, back to the condition he was in before ever touching it; and then as to the future use of alcoholic stimulants, it was entirely with the

patient—he had the power to drink or not, just as he wished to use it.

These "cures"—for there are a number—consist in giving remedies by the mouth and hypodermically.

The system of treatment I have partial knowledge of, from direct information and from testing the main solution, uses two solutions for hypodermic action. One is spoken of as a restorative and nerve food, and contains the double chloride of gold and sodium with one of the strychnia salts. The other solution contains one of the alkaloids allied to atropia, and is relied upon as sedative in action. The remedy by mouth consists of bitter tonics, such as hydrastis, cinchona, etc.

The term bichloride, as applied to gold, is a misnomer, for there are only two chlorides of gold, the aurous or monochloride, which is insoluble in water, and the auric or trichloride, soluble in water, alcohol, and ether; there are a number of double chlorides, and the double chloride of gold and sodium is the salt probably used by all.

The most interest centres around the therapeutic value of gold for the cure of alcoholism. I have consulted quite a number of works, both old and new, but have found very little bearing upon the use of gold for any disease. Bartholow's "Materia Medica and Therapeutics" gives more upon the subject than all of the works I have had time to examine, and it will be necessary to quote freely from it.

"*Physiological Action.*—In toxic doses it excites violent gastro-enteritis, accompanied by such nervous phenomena as cramps, convulsive tremblings, insomnia, priapism, insensibility, etc. In small medicinal doses these auric preparations promote the appetite and the digestive capacity. If long continued, especially if the dose be a full medicinal one, epigastric pain and distress are excited, nausea is induced, and loss of appetite follows. Constipation is usually produced by the preparations of gold, and this, notwithstanding an increased secretion of the intestinal glandular apparatus, is one of the results of their administration. A form of fever known as auric-fever is caused by their prolonged administration. This fever is accompanied by profuse sweats, a very abundant flow of urine, and increased salivary secretion. The salivation caused by the preparations of gold differs from the mercurial in that

there is no tenderness nor ulceration of the gums. Peculiar effects on the mental state are produced by the administration of the auric preparations. The functions of the mind become more active and even excited and a state of cheerfulness is induced. In men marked aphrodisiac effects are produced, and the erections are often painful; in women, increased venereal desires and augmentation of the menstrual flow are observed."

"*Under Therapy.*—The chloride of gold and sodium in small doses ($\frac{1}{20}$ grain) three times a day will relieve nervous dyspepsia. A red and glazed tongue, epigastric pain, increased by taking food, and a tendency to relaxation of the bowels after eating are indications for the use of this salt. Catarrh of the duodenum, catarrh of the bile ducts, and jaundice, dependent thereon, are symptoms which may usually be removed by the salts of gold if given in small doses."

The author calls especial attention to the use of the salts of gold in chronic Bright's disease, granular and fibroid kidney. His experience, narrated in successive editions of this work, has continued to be highly favorable, and various confirmatory observations have been published.

"The nature of the curative action consists in the impression made on the connective tissue elements; it prevents or lessens the overgrowth, and hence it is now utilized in the treatment of the various scleroses—of the liver, of the kidney, of the arterial system, and of the nervous system."

"Excellent results are obtained from the use of the double chloride in certain forms of mental disorder—*e.g.*, melancholia, hypochondria, and allied mental states, accompanied by depression. Vertigo and vertiginous sensations, when due to stomach disorders, are often removed by minute doses, but plethora and increased intracranial blood pressure contraindicate their use; on the other hand, they have high degree of utility when there is present the condition of cerebral anæmia."

From the statement of Dr. Bartholow, in reference to the physiological and therapeutical action of gold, it would seem to be pre-eminently useful in the treatment of the various pathological changes produced in the tissues and organs of the body by the continued use of alcohol.

The following words on gold, from "The Edinburgh New Dispensary" of 1796, are of interest in this connection:

"This metal was introduced into medicine by the Arabians, who esteemed it one of the greatest cordials and comforters of the nerves. From them Europe received it without diminution of its character; in foreign pharmacopœias it is still retained, and even mixed with the ingredients from which simple waters are to be distilled. But no one, it is presumed, at this time expects any singular virtues from it, since it certainly is not alterable in the human body. Mr. Geoffrey, though unwilling to reject it from the cordial preparations, honestly acknowledges that he has no other reason for retaining it than complaisance to the Arabian schools. The chemists have endeavored by many elaborate processes to extract what they call a sulphur or anima of gold. But no method is as yet known of making this metal a useful medicine; all the tinctures of it and aurum potabile which have hitherto appeared are real solutions of it in *aqua regia* diluted with spirits of wine or liquors, and prove injurious to the body rather than beneficial. A place, however, is now given in some of the foreign pharmacopœias to the aurum fulminus; and it has of late been recommended as a remedy in some convulsive diseases, and particularly in the chorea *sancti viti*."

But little need be said about strychnine, the use of which is familiar to all. Dr. Brunton in atonic conditions regards strychnine as ranking very high indeed. By stimulating both the respiratory and cardiac centres it increases oxygen supply and tissue metabolism and tissue renovation.

Dr. Wood says, "As a vegetable bitter, strychnine is a stomachic, stimulating to a greater or less degree the digestion, besides acting more universally on nerve power. It is more than a mere stomachic; clinical experience has shown that it is a most useful tonic when there is general relaxation and loss of nerve power. A portion of its value arises, it may be, from its action upon the spinal motor nerve centres; but in all likelihood it influences other portions of the cord, affecting the vaso-motor centres and most probably also the trophic centres. Be these things as they may, clinical experience has abundantly demonstrated the value of the drug as a tonic in general functional atony and relaxations."

I have not been able to trace up any special action for atropia or allied alkaloids in destroying the taste or desire for alcohol;

but for producing sleep and allaying mental excitement in H. C. Wood's "Therapeutics" hyoscine is referred to as follows:

"The results of my experiments with hyoscine upon the lower animals led to its use as a hypnotic, and it has proved itself a valuable therapeutic agent, especially useful in cases of insomnia with delirious excitement, such as occurs in acute mania and in other forms of insanity. Under these circumstances its effects in producing sleep are often extraordinary; it has been in my experience especially valuable in those cases in which morphine intensified the excitement, and I have frequently seen it succeed after the failure of both chloral and morphine. In delirium tremens it in some cases has acted most favorably. Since the publication of my memoir, hyoscine has been very extensively used with, in most cases, favorable results. The insomnia which is especially relieved by hyoscine is that which is connected with cerebral excitement when sleep is banished by a continual whirl of thoughts or mental images. Excellent effects are sometimes achieved in cases of nervous excitement, with or without insanity, by giving very minute doses of hyoscine, which allay the excitement and produce quiet without causing sleep."

In the mixture given by the mouth (cinchona, hydrastis, etc.) I will only refer to the action of hydrastis in its special use here. Bartholow states: "It is one of the best remedies for the stomach catarrh of chronic alcoholism, and is probably the best substitute, if given in sufficient doses, for the alcoholic stimulant when its habitual use is to be abandoned." Warren says: "In the treatment of alcoholism, hydrastis is most valuable; it supplies the craving want felt by the patient, and at the same time gives tone to his digestion."

It is claimed that whiskey in a short time becomes offensive to taste and smell to the patient under treatment; and I have been informed by "graduates," as they are called, that this is true. I think this action must be due to the constant taste and action upon the stomach of the bitter tonics (a teaspoonful of the mixture being given every two hours while awake) in connection with the injection of strychnia—strychnia, according to Dr. Brunton, rendering the sense of smell more acute. The dryness of the throat, produced by the atropia, probably assists in the accomplishment of this effect.

These hypodermic solutions are given four times per day, and containing such powerful and active agents that great care in using nothing but the purest materials, and great care in the handling of them must be exercised ; especially may this be said of the strychnine and atropia, where idiosyncrasy plays an important part.

These solutions should be prepared by the most skilful pharmaceutists, using alkaloids from the best manufacturers, in order to insure constancy of strength and equality of action.

The remedies are too powerful to put into the hands of the profession at large for the treatment of patients who cannot be seen at any moment and where a very careful selection of the subject may not always be made ; more harm than good would result from such a procedure.

To obtain the greatest good and the least harm from the use of such remedies, they should be used only by those skilled in and accustomed to the use of them, and upon patients under constant supervision during the entire treatment. With such care any value there may be in these gold cures can be developed, otherwise the treatment, which in proper hands may be valuable, will soon be condemned not only as useless, but as positively harmful.

A SLIGHT MISTAKE.—This is an instance where a bad cold caused a startling conversation. A modest young newspaper man was invited to a party at a residence where the home had recently been blessed with an addition to the family. Accompanied by his best girl he met his hostess at the door, and after customary salutations asked after the baby. The lady was suffering from a severe cold, which made her slightly deaf, and she mistakenly supposed that the young man was inquiring about her cold. She replied that though she usually had one every winter, this was the worst she had ever had ; it kept her awake at night a good deal at first and confined her to her bed. Then noticing that the scribe was becoming pale and nervous, she said that she could see by his looks that he was going to have one just like hers, and asked him if he wished to lie down. The paper came out as usual the next week, but the editor has given up inquiring about babies.

MORTALITY AND MORBILITY REPORTS.

By HARRY KENT BELL, M.D.

ALABAMA.—Jerome Cochrane, M.D., State Health Officer, Montgomery.

Mobile, 31,076: T. S. Scales, M.D., Health Officer, reports for the month of January a mortality of 82, of which 39 were colored, and 15 were under five years of age. The annual death-rate per 1000 was 31.56.

Zymotic diseases caused 10 deaths, and consumption, 11.

ARKANSAS.—John I. Hancock, M.D., President, Argentina; D. W. Holman, Secretary, Little Rock.

Hot Springs, March 8th.—There are now about 40 cases of small-pox under treatment here.

Little Rock.—Four cases of what is supposed to be small-pox have been found in the cabin of a negro who says he recently came here from Redfield, 40 miles away.

CALIFORNIA.—C. W. Nutting, M.D., President, Etna Mills; J. R. Laine, M.D., Secretary, Sacramento.

For the month of January the reports from 69 cities, towns, villages, and sanitary districts, aggregating a population of 705,473, show a mortality of 1074—a death-rate of 18.24 per 1000 per annum.

There were 202 deaths from consumption, 105 from acute diseases of the lungs, 5 from diarrhœal diseases, and 62 from other diseases of the stomach and bowels, 15 from diphtheria and croup, 4 from whooping-cough, 29 from typhoid-fever, 6 from cerebro-spinal-fever, 49 from cancer, and 108 from heart disease.

Reports of prevailing diseases from 39 localities, outside of the larger towns and cities, give 245 cases of acute diseases of the lungs, 62 of diarrhœal diseases, 24 of diphtheria and croup, 57 of measles, 125 of *la grippe*, 32 of typhoid-fever, 97 of malarial fevers, 5 of cerebro-spinal-fever, 91 of tonsilitis, and 34 of pharyngitis.

COLORADO.—A. Stedman, M.D., President, Denver; Henry Sewell, M.D., Secretary, Denver.

Fourth Report of the State Board of Health, including the Reports of 1892, 1893, *and* 1894.—All the vitality of this report is that which was prompted by the fear of cholera in 1892. It opens with a brief review of the almost wholly non-operative period of the Board's existence from the time of first organization in 1876, to its awakening in 1892, and then its first act was to appeal to outside help—the adoption of a resolution to memorialize the President to prohibit immigration into the United States during the impending danger of the introduction of cholera. Following this, circulars were issued to the Board of County Commissioners of each county and the mayor of every city in the State, requesting each to appoint a health officer to co-operate with the State Board of Health in its effort to prevent the introduction and spread of infectious and contagious diseases; but the primary measures suggested were exclusively such as related to quarantine. If there were any local conditions promotive of or inviting to infectious diseases anywhere in the State up to the time of the advent of cholera at the Port of New York, in 1892, the Board appears not to have recognized them. But under this spur queries were formulated with regard to local conditions, water supplies, etc.; the interest of the public press was excited, and the people were made to *look at* conditions ever liable to disgrace the much-praised climate hitherto deemed to be all-sufficient. The State Board hitherto was endowed with general and advisory powers only, but it busied itself with the exercise of these, urged the organization of local boards of health throughout the State, some very bad conditions, more or less associated with local epidemics, were revealed; and the people were made to realize that they were in more danger from epidemic diseases of domestic origin than from cholera; and, moreover, that the sanitary measures required for the prevention of the former would be equally efficacious against the latter.

The legislative enactments of April 15th and 17th, 1893, to create a State Board of Health, etc., and to create local boards of health, etc., comprehend such powers and provisions as have been found by practical experience to be most efficacious

in other States; and under these laws the Board has made an excellent beginning. City, town, and county health officers have been appointed, and many local boards of health organized throughout the State; the registration of vital statistics is in process of accomplishment; examination of food, drugs, and water supplies undertaken; action taken against the sale of poisons, and systematic work generally is in process of effective formulation.

Mortality Statistics Reported for the Year 1893 *of Denver only.*—Population (census 1890, 106,713) estimated, 125,000: Deaths (exclusive of 156 premature and still-births), 1734, of which the prevailing causes were, as classified, from communicable diseases, 611; other general diseases, 125; diseases of the digestive system, 286; of the respiratory system, 213; of circulatory system, 88; of nervous system, 159; genito-urinary system, 64; by violence, 102; by poisons, 52; unclassified, 44. Abstract of detail: From pulmonary tuberculosis, 323 (summed up on another page, "cases of phthisis contracted elsewhere, 257"); pneumonia, 140; bronchitis, 27; cholera infantum, 111; diphtheria and croup, 106; typhoid-fever, 71; peritonitis, 30; scarlet-fever, 20; puerperal-fever, 13; cerebro-spinal-fever, 7. Death-rate per 1000 of population, 13.87.

CONNECTICUT.—Professor William H. Brewer, Ph.D., New Haven, President; Professor C. A. Lindsley, M.D., Secretary, New Haven.

The mortality report for January has been received from 161 towns in the State. There were 1036 deaths reported in the State during the month. This was 18 less than in December, and 338 less than in January, 1894, and 413 less than the average number of deaths in January for the five years preceding the present. The death-rate was 15.3 for the large towns, 15.5 for the small towns, and 15.4 for the State. The deaths from zymotic diseases were 131, being 12.4 per cent of the total mortality. There were 116 deaths from consumption.

DELAWARE.—E. W. Cooper, M.D., President, Camden; E. B. Frazer, Secretary, Wilmington.

DISTRICT OF COLUMBIA, 250,000 : W. C. Woodward, M.D., Health Officer.

Mortality report for the four weeks ending February 23d, 437, of which number 171 were of colored people, and 115 were under five years of age. The annual death-rate was 22.34 per 1000. There were 59 deaths from zymotic diseases, and 63 from consumption.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M.D., Secretary, Jacksonville.

The summary, as published in *Florida Health Notes* for the month of December, is as follows :

Number of counties reporting, 45 ; number of cities reporting, 3 ; total population of said counties and cities, 391,422 ; number of deaths reported, 265 ; death-rate per 1000 per annum, 8.01 ; number of deaths under five years of age, 84.

GEORGIA.—

Augusta.—We find in a recent issue of the Augusta *Chronicle*, an elaborate report of Eugene Foster, M.D., President of the Board of Health. The death-rate for 1894, 18.26 per 1000 population : whites, 11.36 ; negroes, 28.41. The death-rate has steadily fallen each year since 1880, when it was 29.56. In 1893 it was 19.61, and last year less. President Foster says :

" It is doubtful if any city in the world can show more remarkable results from sanitary administration than Augusta. When we consider that this result has been obtained by a total annual expenditure of less than $16,000, including sewerage and drainage constructions, certainly it is putting it mildly to say that the most sanguine of your members could not believe that it would be possible. If any city has cause to be proud of her Health Department, Augusta is that one. In 1880 your city appeared in annual reports of various boards of health as having a death-rate, with three exceptions, higher than any city in America. Now the death-rate among your white population, 11.36 per 1000, is as low as that of the most healthful cities in America."

ILLINOIS.—William E. Quine, M.D., President, Chicago ; J. W. Scott, Secretary, Springfield.

Chicago, 1,600,000 : A. R. Reynolds, M.D., Commissioner.

INDIANA.—S. S. Boots, M.D., President, Greenfield ; C. N. Metcalf, M.D., Secretary, Indianapolis.

IOWA.—Frederick Becker, M.D., President, Claremont ; J. F. Kennedy, M.D., Secretary, Des Moines.

Reports of Births, in Iowa, bear a striking resemblance to those of Brooklyn, which we took occasion to notice in reviewing the annual report of the Brooklyn report, February number. A committee of the Iowa State Board of Health remarks :

" As an illustration of the value of these reports, let me cite an instance : The returns from Scott County for 1894 show a large number of births ; but the name of a native American parent or of a native American physician can rarely be found in the record. The returns are all made by German physicians and midwives. Either the native American mothers in that county have ceased child-bearing, or the native American physicians pay little or no attention to the law requiring births to be reported."

From the State Board *Bulletin* for January :

Boone, 10,000, reports for January : Deaths, 14—3 from diphtheria.

Cedar Rapids, 25,000, reports for January : Deaths, 22.

Clinton, 22,000, reports for January : Deaths, 14.

Creston, 10,000, reports for January : Deaths, 5.

Davenport, 35,500, reports for January : Deaths, 36—diphtheria, 5 ; typhoid-fever, 1.

Des Moines, 82,000, reports for January : Deaths, 43.

Keokuk, 18,000, reports for December : Deaths, 15.

Oskaloosa, 8000, reports for January : Deaths, 3.

Dubuque, 40,000, reports for January : Deaths, 40—diphtheria, 4 ; pneumonia, 6 ; consumption, 1.

KANSAS.—T. E. Raines, M.D., President, Concordia ; T. Kirkpatrick, M.D., Secretary, Westphalia.

KENTUCKY.—Joseph M. Matthews, M.D., President, Louisville ; J. N. McCormack, M.D., Secretary, Bowling Green.

LOUISIANA.—S. R. Oliphant, President, New Orleans ; W. R. Harnan, M.D., Secretary, New Orleans.

New Orleans, 254,000—184,500 white, 69,500 colored.

There were reported for four weeks ending February 23d, 696 deaths, of which number 282 were among the colored people, and 159 of children under five years of age. Annual death-rate per 1000, 33.26. Zymotic diseases caused 94 deaths, and consumption, 85.

MAINE.—C. D. Smith, M.D., President, Portland; A. G. Young, M.D., Secretary, Augusta.

MARYLAND.—John Morris, M.D., President, Baltimore; James A. Steuart, M.D., Secretary, Baltimore.

Baltimore, 455,427: James F. McShane, M.D., Commissioner, reports for the month of January that the total deaths were 841, a decrease of 63, compared with the corresponding month of January, 1894. Of these 664 were whites, and 177 colored; a death-rate of 18.82 per 1000 for the former, and 28.70 per 1000 for the latter. The death-rate per 1000 for the whole population was 20.34. Fifty-two died from infectious diseases, 96 from consumption, 90 from pneumonia, 30 from bronchitis, 11 from influenza, 10 from Bright's disease, 19 from nephritis, and 11 from typhoid-fever. Two hundred and seventy-two, or 32.34 per cent of the total deaths, were in children under five years of age.

During the month 277 cases of infectious diseases were reported, an increase of 56 compared with the preceding month.

MASSACHUSETTS.—H. P. Walcott, M.D., Chairman, Cambridge; S. W. Abbott, M.D., Secretary, Boston.

Boston, 501,107: S. H. Durgin, M.D., Chairman, reports for the month of January 960 deaths, of which 380 were under five years of age. The annual death-rate was 22.98 per 1000. From zymotic diseases, including tubercular diseases (157), there were 335 deaths, of which 65 were due to diphtheria and croup, and 17 to scarlatina. Of these and other zymotic diseases the number of cases reported during the month were: Diphtheria, 340; measles, 269; scarlatina, 231; typhoid-fever, 28.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M.D., Secretary, Lansing.

Bulletin for February, 1895: Compared with the preceding

month, inflammation of kidney and diarrhœa increased, and scarlet-fever decreased in area of prevalence.

Compared with the average for corresponding months in the nine years 1886–94, inflammation of kidney was more prevalent, and intermittent-fever, erysipelas, consumption, pleuritis, remittent-fever, and diarrhœa were less prevalent in February, 1895.

Including reports by regular observers and others, scarlet-fever was reported present in Michigan in the month of February, 1895, at one hundred and five places; typhoid-fever at forty-one places; diphtheria at forty-one places; measles at twenty places, and small-pox at eight places.

Reports from all sources show diphtheria reported at forty-three places less; scarlet-fever at thirty-one places less; typhoid-fever at twenty-eight places less; small-pox at six places less, and measles at five places less in the month of February, 1895, than in the preceding month.

MINNESOTA.—Franklin Staples, M.D., President, Winona; C. N. Hewitt, M.D., Secretary, Red Wing.

Minneapolis, 223,700: E. S. Kelley, M.D., Commissioner, reports for January 206 deaths—87 under five years of age. Death-rate per 1000, 9.44. From zymotic diseases there were 15 deaths, of which 4 were from typhoid-fever; and from tubercular diseases, 29.

St. Paul, 155,000: H. F. Hoyt, M.D., Commissioner, reports for January 130 deaths—53 under five years of age. Annual death-rate per 1000 was 10.07. Deaths from zymotic diseases, 17; and from tubercular diseases, 22. Contagious diseases reported, 50, of which 27 were of diphtheria and croup, 18 of scarlet-fever.

MISSISSIPPI.—W. F. Hyer, M.D., President, Meriden; Wirt Johnson, M.D., Secretary, Jackson.

MISSOURI.—F. J. Lutz, M.D., President, St. Louis; Willis P. King, M.D., Secretary, St. Louis.

St. Louis, 540,000: George Homan, M.D., Commissioner of Health.

Report for the month of January: Deaths, 703; under five

years of age, 205 ; from zymotic diseases, 104—50 from diphtheria and croup ; from phthisis and tuberculosis, 78. Annual death-rate per 1000, 15.6.

Kansas City, 124,000 : R. P. Waring, M.D., Health Officer. Deaths for January, 164 ; under five years of age, 55. Annual death-rate per 1000 was 13.12. Contagious and infectious diseases reported for the month, 77, of which there were of diphtheria, 42.

NEBRASKA.—J. V. Beghtol, M.D., President, Friend ; F. D. Haldeman, M.D., Secretary, Ord.

Reno.—Typhoid-fever is reported to be epidemic throughout the city.

NEVADA.—S. L. Lee, M.D., President, Carson City ; J. A. Lewis, M.D., Secretary, Reno.

NEW HAMPSHIRE.—G. P. Conn, M.D., President, Concord ; Irving A. Watson, M.D., Secretary, Concord.

NEW JERSEY.—C. F. Brackett, M.D., President, Princeton ; Henry Mitchell, M.D., Secretary, Asbury Park.

Newark, estimated 200,000 : Charles Sehlbach, M.D., Medical Officer of Health, reports for the month of August : Deaths, 421 ; under five years of age, 305 ; from zymotic diseases, 181 ; and from consumption, 71. Annual death-rate, 24.78.

NEW YORK.—F. O. Donohue, M.D., President, Syracuse ; J. S. Barnes, M.D., Secretary, Albany.

For January the State Board *Bulletin* reports there were 10,980 deaths reported, which is an estimated death-rate per 1000 population annually of 20.18, and a daily average mortality of 354, an increase of 64 deaths daily over December, when the death-rate was 16.60. The total mortality is a little greater than that of January, 1894, compared with which month there were 100 more deaths from acute respiratory diseases and the same from consumption, while from common zymotic diseases there were 250 fewer deaths, the increase being in deaths from local diseases. Compared with December, 1894, there were 100 fewer deaths from zymotic diseases,

but there were 1000 more deaths attributed to acute respiratory diseases, 100 more from consumption, 200 more from diseases of the circulatory system, 100 more from old age, and 500 more from unclassified causes. The increase over December is distributed over all parts of the State, but is most marked in the maritime district, in which alone is the mortality greater than that of a year ago. Epidemic influenza, which failed to impress the mortality of December, has caused the increase of this month, and it is estimated that there were 1400 deaths attributed to it, or 200 more than in January, 1894, and except for it the mortality of the month would probably not have exceeded 9565, or about the average of the past ten years; it will apparently cause a still larger mortality in February. The zymotic mortality (aside from *grippe*) is unusually low. Typhoid-fever has decreased since December, and is the same as usual for this season. Measles is much less prevalent than a year ago. Diphtheria has not caused so few deaths in January for several years, and the number has fallen from 672 in December, which was about the average for that month, to 547, the decrease showing itself in all parts of the State. Whooping-cough caused 77 deaths, and it appears to be pretty generally distributed, deaths occurring in the country as well as the cities. Other zymotic diseases show little variation. From small-pox there were 3 deaths, all in New York; there is one case of this disease in Utica and two in the town of Westchester, developing during the month. Consumption, the reported mortality from which increases during a *grippe* epidemic, caused 1237 deaths, which is excessive. The mortality from local diseases, from the same cause, is increased, but deaths from old age have not shown the marked increase noted in January, 1894. The weather was characterized by low temperature, 3° below the average normal, and westerly winds, with deficiency in precipitation.

New York, 1,995,000: Total deaths, 4192—1386 under five years. Death-rate, 24.75. Zymotic diseases per 1000 deaths from all causes, 135.70; 219 from croup and diphtheria. Deaths from consumption, 489.

Dr. Biggs, bacteriologist, reported, March 12th, that the use of antitoxin had reduced the general mortality of the city

at large from diphtheria 40 per cent. He also said that the supply of antitoxin in the department was adequate, and that upon application to the department inspectors would be sent to treat poor patients free.

Brooklyn, 1,086,000: Total deaths, 2074—614 under five years. Death-rate, 22.50. Zymotic diseases per 1000 deaths from all causes, 105.15; 148 from croup and diphtheria. Deaths from consumption, 239.

Syracuse, 91,944: Total deaths, 131—34 under five years of age. Death-rate, 17.10. Zymotic diseases per 1000 deaths from all causes, 92.30; croup and diphtheria, 4. From consumption, 20.

Albany, 98,000: Total deaths, 220—66 under five years. Death-rate, 26.84. Zymotic diseases per 1000 deaths from all causes, 118.20; croup and diphtheria, 5. From consumption, 35.

Since February 1st (Albany *Journal*, March 12th), 101 cases of typhoid-fever have been reported to the Health Board in this city, and it is fair to say that 60 or 70 cases exist at the present time. In view of the fact that river water is being drunk by people in every part of the city, this is not considered more than a normal number of cases at this season of the year.

Buffalo, 300,000: Total deaths, 372—149 under five years. Death-rate, 14.88. Zymotic diseases per 1000 deaths from all causes, 186.50; from diphtheria and croup, 34. From consumption, 44.

Measles is epidemic. It started a month ago (*Commercial*, March 4th) in the Normal School, and nearly all the children came down with it. Since that time it has been quite an epidemic, and the total number of cases reported during February was 209. Five deaths resulting from measles were reported last month, and one in January.

Rochester, 150,000: Total deaths, 228—68 under five years. Death-rate, 18.25. Zymotic diseases per 1000 deaths from all causes, 80; croup and diphtheria, 9. From consumption, 18.

Elmira.—Health Officer Dr. W. C. Wey made a verbal report (*Telegram*, January 27th) at the meeting of the Board of Health, January 23d. His report covered a period from December 21st to January 22d. Forty-seven typhoid-fever

cases were reported. The cause of the disease could not be traced, and it is the general opinion of medical authorities that the prevalence of the disease is largely due to the condition of the atmosphere and like causes.

NORTH CAROLINA.—H. T. Bahnson, M.D., President, Salem; Richard H. Lewis, M.D., Secretary, Raleigh.

Bulletin of the State Board of Health for January: Thirty towns, aggregating 148,104 population, deaths, 171; 80 were of colored people, and 38 were of children under five years of age.

The annual death-rates were 12.5 per 1000 for the white population, 15.7 for the colored population, and 13.8 for the total. From consumption, 31.

Asheville, 12,000: Total deaths, 14: consumption, 7—visitors. Annual death-rate, 14 per 1000.

Charlotte, 14,000: Total deaths, 23. Annual death-rate, 18.4 per 1000.

Raleigh, 15,000: Total deaths, 25. Annual death-rate, 20.0 per 1000.

Wilmington, 22,000: Total deaths, 37. Annual death-rate, 20.2 per 1000.

NORTH DAKOTA.—Hon. W. H. Standish, President, Bismarck; F. H. DeVaux, M.D., Superintendent, Valley City.

Biennial Report of the State Board of Health for the Years 1893 *and* 1894.—A pamphlet of eighty-four pages, comprehending the State health laws, list of superintendents of county boards of health of the State, summary of sanitary authorities and associations of the United States, Canada, and Mexico, special subjects of investigation by the State Board during the two years, summary of the reports of vital statistics, and several papers on allied subjects.

In an epidemic of *diphtheria* in a Russian settlement north of Knife River, in Mercer County, in 1894, with a population of about 300 persons, investigated by Dr. F. R. Smyth, of Bismarck, there had been within the eight months previous to April 27th thirty-two fatal cases, all children under twelve years of age. They were all treated with domestic remedies only by their parents or friends, there being no physician in

the neighborhood. The disease seems to have exhausted itself, no case being in existence at the time of the investigation, April 26th–27th; and there was nothing in the location of the settlement or its surroundings to account for the outbreak—a high, rolling prairie on the west bank of the Missouri. So far as ascertainable, it appeared to have been introduced by immigrants from the eastern part of Europe *via* New York.

"The first cases were those of the children of George Wiedriech, four of whom died. His brother came to this country from Russia on the steamship *Frieslander*, landing in New York on November 28th, 1893, and some children died on the ship during the voyage, but from what disease I was unable to learn. Within a week of this immigrant arriving at his brother's house the children of the latter were taken sick with diphtheria, and it soon spread over the settlement."

Typhoid-fever prevailed at Grand Forks to an alarming extent during the winter of 1893–94, from the usual cause—polluted drinking-water. Effective measures were promptly instituted for its prevention.

Vital Statistics reported from July 1st, 1893, to December 15th, 1894: Births, 2954; deaths, 1321. Typhoid-fever was reported from all parts of the State; there were from this disease alone 178 deaths—the greatest number from Grand Forks County. From diphtheria, 65—36 in the Russian colony in Mercer County. From scarlet-fever, 16; and from consumption, 59. But such statistics, in default of stated population, are worthless.

OHIO.—Byron Stanton, M.D., President, Cincinnati; C. O. Probst, M.D., Secretary, Columbus.

Toledo, 120,000: J. Wood, M.D., Health Officer, reports for January: Deaths, 106—20 under five years of age, representing an annual death-rate of 10.59 per 1000. From zymotic diseases, 30; from consumption, 9.

OKLAHOMA TERRITORY.—L. L. Parker, President, Kingfisher; C. D. Arnold, M.D., Secretary, El Reno.

PENNSYLVANIA.—S. T. Davis, M.D., President, Lancaster; Benjamin Lee, M.D., Secretary, Philadelphia.

Philadelphia, estimated to the middle of 1895, 1,163,864:

M. Veale, Health Officer, reports: In the four weeks ending February 23d, deaths, 2108—707 under five years of age. Annual death-rate, 23.5 per 1000. Deaths from zymotic diseases, 219; from consumption, 191.

Mayor Stuart announced, February 26th, the appointment of Dr. B. Meade Bolton, Chief of the Division of Pathology, Bacteriology, and Disinfection in the Bureau of Health.

Dr. Bolton has been teaching bacteriology ever since 1886, and has acquired a reputation here and abroad as one of the foremost bacteriologists of this country. The Health Department of Philadelphia is to be congratulated on his acquisition.

Pittsburgh, 272,000: J. Guy McCandless, M.D., Registrar, reports for four weeks ending February 23d: Deaths, 359—128 under five years of age. Deaths from zymotic diseases, 128; from consumption, 28. Annual death-rate, 17.08.

RHODE ISLAND.—A. G. Sprague, M.D., President, River Point; Gardner T. Swarts, Secretary, Providence.

SOUTH CAROLINA.—J. R. Bratton, M.D., Chairman, Yorkville; H. D. Fraser, M.D., Secretary, Charleston.

Charleston, 65,165 white, 28,870 colored: 36,295: H. B. Horlbeck, M.D., Health Officer, reports for four weeks ending February 23d: Deaths, 121—85 colored. Under five years, 32; deaths from consumption, 15. Annual death-rate, 24.13 per 1000.

SOUTH DAKOTA.—C. B. Alford, M.D., President, Huron.

TENNESSEE.—J. D. Plunkett, M.D., President, Nashville; J. Berrien Lindsley, M.D., Secretary, Nashville.

The principal diseases, named by the State Board *Bulletin*, in the order of their greater prevalence, in the State for the month of January were lung diseases acute, *la grippe*, measles, typhoid-fever, consumption, whooping-cough, mumps, scarlet-fever, chicken-pox, malarial-fever, diphtheria, and rheumatism.

Chattanooga, 40,000: Total deaths, 35—colored, 18. Annual death-rates per 1000, white, 7.55; colored, 16.61: total, 10.50.

Knoxville, 40,385 : Total deaths, 62—colored, 21. Annual death-rate per 1000, white, 15.72 ; colored, 27.65 : 18.42.

Memphis, 57,951 : Total deaths, 130—colored, 64. Annual death-rates per 1000, white, 28.21 ; colored, 27.56 : 27.89.

Nashville, 87,754 : Total deaths, 138—colored, 62. Annual death-rates per 1000, white, 16.70 ; colored, 22.43 : 18.86.

TEXAS.—R. M. Swearingen, M.D., State Health Officer, Austin.

UTAH TERRITORY.

Salt Lake City, W. T. Dalby, M.D., Health Commissioner.

VERMONT.—C. S. Caverly, M.D., President, Rutland ; J. H. Hamilton, M.D., Secretary, Ritchford.

VIRGINIA.—R. W. Martin, M.D., President, Chatham ; A. Irving, M.D., Secretary, Richmond.

WASHINGTON.—J. R. Hathaway, M.D., President, Everett ; G. S. Armstrong, M.D., Secretary, Olympia.

WEST VIRGINIA.—W. P. Ewing, M.D., President, Charleston ; N. D. Baker, Secretary, Martinsburg.

WISCONSIN.—J. W. Hancock, M.D., President, Ellsworth ; U. O. B. Wingate, M.D., Secretary, Milwaukee.

Milwaukee, 275,000 : W. Kempster, M.D., Commissioner, reports for January : Deaths, 330—155 under five years of age.

Cases of infectious diseases reported : Diphtheria, 37 ; scarlet-fever, 19 ; small-pox, 62 ; typhoid-fever, 23 ; measles, 11 ; admitted to City Isolation Hospital, 16.

Deaths from diphtheria and croup, 19 ; typhoid-fever, 9 ; small-pox, 10 ; whooping-cough, 6 ; consumption, 25.

PROVINCIAL BOARD OF HEALTH OF NEW BRUNSWICK.—William Bayard, M.D., Chairman, St. John ; George E. Coulthard, M.D., Secretary, Fredericton.

PROVINCIAL BOARD OF HEALTH OF NOVA SCOTIA.—Hon.

W. S. Fielding, Premier and Provincial Secretary, Chairman; A. P. Reid, M.D., Secretary, Halifax.

PROVINCIAL BOARD OF HEALTH OF ONTARIO.—John Duff Macdonald, M.D., Chairman, Hamilton; Peter H. Bryce, M.D., Secretary, Toronto.

PROVINCIAL BOARD OF HEALTH OF QUEBEC.—E. P. Lachapelle, M.D., President, Montreal; Elzear Pelletier, M.D., Secretary, Montreal.

Montreal.—Report of the Sanitary State and Vital Statistics for the Year 1893.—Louis Laberge, M.D., Medical Health Officer.

During the year radical changes were effected in the means of garbage disposal, providing for the incineration of *all* the refuse and dead animals, and the work to be performed only in the night time; removal and incineration of night soil, and improvement in the use of the public baths.

Vital Statistics.—Population, 231,560, as follows: French Canadians, 134,865; other Catholics, 39,364; Protestants, 57,331. Births during the year, French Canadians, 7254—53.78 per 1000; other Catholics, 1174—29.80 per 1000; Protestants, 1659—28.81 per 1000: totals, 10,080—43.53 per 1000.

Deaths, French Canadians, 3926—29.10 per 1000; other Catholics, 918—23.32 per 1000; Protestants, 938—16.36 per 1000: totals, 5782—24.96.

Among the principal causes of death, debility is credited with 690. Of the total number of deaths 3208, or 55.48 per cent, were of children under five years of age. Five hundred and sixty-five, or 9.77 per cent of the total from all causes, were caused by phthisis, 376 by pneumonia, 271 by bronchitis; 1470 were caused by zymotic diseases, as follows: diarrhœal diseases, 825; *cholera canadensis* (?), 6; scarlatina, 193; diphtheria and croup, 127; cerebro-spinal meningitis, 79; measles, 53; typhoid-fever, 48; other fevers, 33; *la grippe*, 42; whooping-cough, 16; erysipelas, 15.

The most healthful month in the year was October; the mean death-rate was 10.67. The mean temperature for the month was 50.29°. The highest mortality was in December;

the mean death-rate, 23.19. The mean temperature for the month was 11.81°.

The average death-rate for a period of twenty-three years (from 1872, when the death-rate per 1000 of population was 37.36, to 1893, when it was, as above stated, 24.96) has been 29.62. The lowest during the period was 24.24, in 1891 ; the highest, 46.71, in 1885, the year of the small-pox epidemic.

MANITOBA.—John H. O'Donnell, M.D., Chairman, Winnipeg ; C. J. Jamison, M.D., Secretary, Winnipeg.

SUPERIOR BOARD OF HEALTH OF MEXICO. — Eduardo Dicéaga, President, Mexico ; José Ramirez, M.D., Secretary-General, Mexico.

BUENOS AYRES, 580,371 : Albert B. Martinez, Director-General of Municipal Statistics.

There were 1426 deaths reported during the month of November, of which number 853 were under the age of five years. There were 102 deaths from epidemic diseases, and 135 from consumption. Annual death-rate per 1000, 27.9.

MORTALITY STATISTICS ABROAD FOR THE YEAR 1894.

Population, total number of deaths, annual death-rates, deaths from small-pox and cholera :

London, 4,349,166 ; 77,063 ; 17.7 ; 103. Glasgow, 677,883 ; 13,561 ; 20.0 ; 16. Manchester, 520,211 ; 10,593 ; 20.4 ; 23. Liverpool, 507,230 ; 12,062 ; 23.8 ; 20. Birmingham, 492,301 ; 9125 ; 18.5 ; 173. Leeds, 388,761 ; 6928 ; 17.8 ; 3. Dublin, 349,594 ; 8636 ; 24.7 ; 68. Sheffield, 333,922 ; 5994 ; 17.9. Edinburgh, 265,672 ; 4716 ; 17.8 ; 57. Belfast, 265,123 ; 6615 ; 25.0. Bristol, 226,578 ; 3496 ; 15.4 ; 11. Bradford, 223,985 ; 3800 ; 16.9 ; 27. Nottingham, 223,584 ; 3829 ; 17.1 ; 4. Hull, 212,679 ; 3683 ; 17.3 ; 3. Salford, 205,828 ; 4310 ; 20.9 ; 2. Newcastle, 201,947 ; 3687 ; 18.3. Portsmouth, 170,973 ; 2581 ; 15.1 ; 4. Norwich, 105,645 ; 1974 ; 18.7. Amsterdam, 446,295 ; 8150 ; 18.3 ; 4 ; 39. Rotterdam, 228,579 ; 4616 ; 20.2 ; 314 ; 7. The Hague, 174,790 ; 2946 ; 16.9. Paris, 2,424,705 ; 48,988 ; 20.2 ; 173 ; 2. Lyons,

438,077; 8952; 20.4. Lille, 200,325; 4709; 23.5; 1; 10. Nantes, 125,029; 2989; 23.9; 51. St. Étienne, 133,443; 3024; 22.7. Havre, 116,369; 3473; 29.8; 75. Rouen, 111,847; 3502; 31.3; 44; 17. Rheims, 105,408; 2723; 25.8; 0; 1. Nice, 97,720; 1923; 19.7. Nancy, 87,875; 1905; 21.7; 1. Amiens, 83,977; 1841; 21.9; 2. Besançon, 54,636; 1218; 22.3; 6. Berlin, 1,767,639; 30,479; 17.2. Hamburg, 594,209; 10,762; 18.1. Leipzig, 401,251; 7519; 18.7. Munich, 390,000; 9238; 23.7. Breslau, 360,660; 9181; 25.5; 1; 1. Dresden, 316,660; 6503; 20.5; 1. Cologne, 311,957; 7213; 23.1. Magdeburg, 232,846; 5078; 21.8. Frankfort, 198,238; 3263; 16.5. Königsberg, 169,202; 4286; 25.3. Nuremberg, 162,442; 3477; 21.4. Chemnitz, 159,117; 3876; 24.4. Altona, 155,393; 2816; 18.1. Düsseldorf, 154,488; 3202; 20.7. Elberfeld, 137,853; 2180; 15.8. Stuttgart, 133,338; 2470; 18.5. Stettin, 128,186; 3363; 26.2. Dantzig, 124,305; 2975; 23.9. Crefeld, 116,220; 2002; 17.2. Halle, 115,319; 2436; 21.1. Aix-la-Chapelle, 109,021; 2404; 22.1. Essen, 88,481; 1865; 21.1. Brussels, 498,400; 9034; 18.1; 20; 1. Berne, 47,620; 996; 21.0; 8. Basle, 75,114; 1386; 18.5; 1. Geneva, 78,777; 1499; 19.0. Lausanne, 35,623; 658; 18.5; 1. Zurich, 103,271; 1956; 18.9; 2. Chaux-de-fonds, 27,511; 498; 18.1; 2. Vienna, 1,465,537; 33,355; 22.8; 18. Buda-Pesth, 552,769; 13,451; 24.3; 79. Prague, 339,172; 7512; 22.1; 3. Trieste, 159,739; 4812; 30.1; 58. Gratz, 116,475; 2853; 24.5. Brünn, 97,411; 2741; 28.1; 1. Cracow, 78,183; 2790; 35.7; 4; 95. Presburg, 57,634; 1769; 30.7. Copenhagen, 341,000; 6368; 18.7. Stockholm, 252,927; 4605; 19.4. Christiania, 161,151; 3146; 19.6. St. Petersburg, 954,400; 29,940; 31.4; 99; 2701. Moscow, 753,469; 25,671; 34.1; 104. Warsaw, 500,931; 12,548; 25.0; 212; 543. Odessa, 324,500; 7237; 22.3; 29. Naples, 522,658; 14,474; 27.7; 5. Turin, 335,111; 6316; 18.8; 6. Venice, 160,406; 3463; 21.6. Bologne, 141,297; 3092; 21.9. Bucharest, 206,000; 6169; 29.9; 2; 1. Jassy, 80,428; 2273; 28.3; 1. Cairo, 353,188; 18,850; 53.4; 9. Alexandria, 181,703; 9050; 49.8; 15. Damietta, 43.502; 1396; 30.1; 1. Suez and Ismailia, 12,406; 603; 48.6. Port Said, 10,693; 585; 54.7. Bombay, 821,764; 27,320; 33.2; 529; 385.

HYGIENE OF PARIS IN 1894.—The movement of the population of a city of 2,500,000 inhabitants constitutes a source fecund with practical teachings of hygiene, says *L'Union Médicale.* Pathogenic influences are felt there so keenly and translated in such exact proportions that they are amplified, so to speak, as by a projecting instrument. When the temperature is lowered suddenly the number of pneumonias is correspondingly elevated; when from any cause it is necessary to turn the Seine water into the city pipes, the typhoid curve is elevated and remains so during the time of this exceptional distribution; when a small epidemic of variola develops, the number of vaccinations is multiplied, and soon the disease falls below the normal. Differences of detail, errors in diagnosis—all causes of error fade away before the authoritative evidence of large numbers. The year just ended is particularly interesting, and the weekly bulletins of the municipality furnish the necessary figures. The first thing that strikes one is the notable diminution in the general mortality. It is more than a tenth lower than the mean of the three preceding years. And what is still more remarkable, this diminution is not found in the communicable diseases. Typhoid-fever, variola and phthisis, on the contrary, present a rather marked elevation. The first two, in fact, assumed somewhat the nature of an epidemic at the beginning of the year. Diphtheria alone fell below the mean. The following table shows these differences more clearly:

Year.	Typhoid-Fever.	Variola.	Diphtheria.	Tuberculosis.	Total Mortality.
1891....	476	39	1,361	11,895	52,558
1892....	799	42	1,557	12,153	57,137
1893....	649	302	1,465	12,267	52,955
1894....	758	183	1,149	12,288	49,079

The constant augmentation of the number of deaths due to disease is also worthy of note. It is in accord with the progressive increase of the population. The Minotaur exacts each year its proportional tribute of young lives without being influenced by anything.

MEDICAL EXCERPT.

By T. P. Corbally, A.M., M.D.

Serum Therapy.—MM. Lebreton and Magdelain have presented to the Société Medicale des Hôpitaux (*Gazette Hebdomadaire*, February 10th) the results of their observations at the Children's Hospital, in regard to the treatment of diphtheria with the so-called *serum therapy*.

There were 31 deaths in 238 patients, giving a mortality of 12 per cent, which they claim would have been still lower—not more than 9 or 10 per cent—if the cases that died within twenty-four hours after admission were deducted from the cases treated. There was no serious accident from the 1200 injections made, only one of which caused suppuration.

There were a few cases of eruption on the skin, and in some of the cases a slight elevation of the temperature was observed. A few cases of albuminuria were found.

MM. Lebreton and Magdelain are not in favor of injections as a means of prophylaxis; they consider it useless.

They have tried tubage in cases of threatened asphyxia, and as a result in such cases the mortality was 15 per cent. Consequent on the anti-diphtheritic treatment, the tendency is to abandon tracheotomy for the old operation of Bouchut.

Tubage requires more skill than tracheotomy, and necessitates the constant watching of a skilled physician; it is necessary to be always ready to replace the tube in case it be displaced or expelled. The patient on whom tracheotomy has been performed is much more easily managed, and the canula is more easily cleaned than the tube. For this reason MM. Lebreton and Magdelain consider tubing as suitable only for hospital practice, while it is rarely practicable in the city, unless a constant medical supervision can be engaged.

M. Chautemesse defended preventive injections, which he considers as always harmless if given in proportion, one to two cubic centimetres. He thinks that by this method immunity from the disease can always be insured.

M. Rommelaere has found the treatment unsuccessful in Belgium in the diphtheria with the presence of streptococcus.

THE GRIP ASSUMES A PSEUDO-TUBERCULOUS FORM.—M. Lemoine, of Lille, presented to the Congrès Français de Médecine Interne (*La France Médicale*) a report of cases in which the grip simulated the form of tuberculosis: pneumonia of the summit, lobar pneumonia of one side, and a form which terminates in dilatation of the bronchiæ. These forms are complicated with symptoms analogous to those of tuberculosis; also the general symptoms are identical—rapid pulse, hectic fever, rapid loss of flesh, night sweats.

The only means we have of making a differential diagnosis is by determining the absence or presence of the bacillus of Koch.

The prognosis in such cases is favorable, and recovery is the rule.

THE PROGNOSIS IN TYPHOID-FEVER.—M. Moussons, of Bordeaux (*La France Médicale*, March 1st), reports to the Congress in regard to the prognosis in cases of typhoid-fever in children as less serious than in adults. The mortality in children has been estimated at from 6 to 8 per cent. The statistics of M. Moussons is based on 66 cases, in which he lost only one patient. This suggests a very favorable prognosis. The treatment was as follows: Calomel every third day during the first fifteen days; in the intervening days, and after the discontinuance of the calomel, intestinal antiseptics. Every day three cold acidulated lotions; two cold injections of boiled water; quinine until the temperature falls below 38° C. Milk diet; drinks freely given. In the ataxic and hyperthermic forms, cold baths.

DESQUAMATION IN THE TYPHOID-FEVER OF CHILDREN.—M. Weil, of Lyons, states to the same Congress that this form of desquamation is frequent. In 37 cases he found it in 33, and remarks that it is much more frequently met with on the trunk, the upper portion of the limbs, and on the neck; it begins to peal generally in the axilla.

It is generally furfuraceous, sometimes scaly, and more rarely it falls off in large flakes. It begins generally near the end of the fever, sometimes when the fever disappears, and sometimes even after all febrile symptoms have passed away.

This desquamation has no diagnostic value, nor does it afford any ground for prognosis; it is a phenomenon similar to the changes that take place in the nails, and to the falling out of the hair.

TREATMENT OF TYPHOID-FEVER WITH COLD BATHS.—The report of M. Glenard to the same Congress confirms a statement, already published in THE SANITARIAN regarding the value of cold baths in typhoid-fever. The value of this treatment, which, he states, was introduced twenty years ago in France, is no longer questioned; it is the specific for typhoid-fever; it reduces the mortality to a minimum; it is applicable in all cases, and can be employed in private practice as well as in hospitals, in the country as in the city.

ATROPHY AND THE ARREST OF GROWTH OF THE FOOT A CONSTANT SIGN OF COXALGIA.—M. Vincent has made a report to the Société de Médecine, of Lyons (*Gazette Hebdomadaire*, February 3d), of an interesting study of coxalgia mainly within the acetabulum. This lesion causes the patient to place the lower limb from the earliest stages of the disease in the position of adduction.

This position he claims to be a certain and unfailing sign of this form of coxalgia.

Another communication equally interesting, which was made by M. Vincent, includes a series of researches made on patients suffering with articular lesions of the lower limbs, in which the imprint made by the foot, as taken by M. Vincent, indicated, in cases of coxalgia, atrophy and arrest of growth of the foot on the side on which the hip had been resected. This condition has been demonstrated by the production of a certain number of imprints of the foot taken at periods more or less remote from the beginning of the coxalgia and of the resection. The arrest of growth refers to the skeleton of the foot, both as to its length and thickness—*sens de l'épaisseur*.

An examination of the calcaneum enables us to determine, better than a study of any other part of the skeleton of the foot, the arrest of the development of the length and the thickness. This evident atrophy of the bones is measured with difficulty as to mathematical precision, because it is ac-

companied with atrophy of the soft tissues. The muscles and the adipose tissues suffer a marked loss of development.

The atrophy and the arrest of growth of the foot is a constant sign of coxalgia; in a general sense these phenomena seem to be in proportion to the gravity and to the duration of cases of tuberculous coxalgia or strepto-staphylo-coxalgic disease. This symptom of trapho-nervosis and of inhibition of the growth persists after the cure of the coxalgia and of the other affections of which it is the consequence, so that if there be a doubt regarding the disease, the plantar impressions will most certainly remove it.

The arrest of growth in the foot is not a symptom peculiar to coxalgia; it may be found during the period of growth accompanying all the affections of the joints in the lower limbs, whether inflammatory or not, and of all the prolonged inflammatory affections of the bones in their diaphesis in the lower limbs. M. Vincent has had no opportunity to observe cases of degeneration from malignant causes.

He presented to the Society impressions of the feet taken under the circumstances described, which were intended to demonstrate the propositions which he had just placed before them. These impressions constitute very useful and interesting points of semiology in medico-legal cases.

WOUND OF THE ABDOMINAL ORGANS EXTRAORDINARY, AND RECOVERY. *Resection of the uterus, suture, cure.*—M. Albaran recently presented to the Société de Chirurgie (*La France Médicale*, February 9th) a patient who had received a wound in the abdomen above the umbilicus from a pistol ball. The patient was then pregnant. Five hours after the accident laparotomy was performed, and four distinct perforations were found in a loop of the small intestines in a length of 20 centimetres. This part was resected, and the parts of the intestines were sutured end to end. Then a ligature was placed on a branch of the mesenteric artery. But in addition to this there was a double opening into the gravid uterus, through which escaped a loop of the umbilical chord, which was folded among the intestines. The chord was replaced, and the openings into the uterus were closed with sutures. The following day the injury was followed by abortion.

The patient recovered completely, and is now, seven months after the operation, in perfect health.

A NEW CURE FOR HAY-FEVER.—Fuber, of Hamburg, who suffered a great deal from hay-fever during last summer, noticed that in winter a coryza was accompanied with hot ears, which regained their normal temperature when the discharge from the nose was established. He tried a reverse order of things on the hay-fever, and rubbed his ears until they became red and hot. It is now the third summer he has led an endurable existence. As soon as there is the least amount of fulness in the nose, the ears are noticeably pale. A thorough rubbing of the ears has always succeeded in freeing the nasal mucous membrane from congestion. The rubbing must be thorough and repeated.—*Medical Reporter, Calcutta.*

CATARRHAL AFFECTIONS.—An excellent cleansing and disinfecting solution for free use in the nasal cavities, by means of the spray apparatus, douche or syringe, is prepared as follows:

℞	Acidi Boracici	ʒ i	
	Sodii Boras	ʒ i	
	Sodii Chloridi	ʒ ss	
	Listerine	℥ ii	
	Aquæ Puræ	℥ vi	M.

CHRONIC RHINITIS.—In the remedial treatment, the following has proven of service, used with the atomizer twice or thrice daily. If used as a douche, dilute with two or three parts water. Note: The iodine is decolorized in preparation, a clear solution of light amber color resulting:

℞	Sodii Boras	ʒ ss	
	Sodii Bicarb	ʒ i	
	Aquæ Puræ	℥ ii	
Dissolve and add			
	Acid Carbol	grs. xv	
	Tr. Iodi	ʒ iii	
	Listerine q. s. ft	℥ vi	M.

EDITOR'S TABLE.

SANITARIAN, APRIL NUMBER, 1895.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

STABLE NUISANCES IN BROOKLYN.

Stable is here used in a twofold sense: to characterize the nature of the nuisances and their permanence.

When scientific sanitation was first undertaken in Brooklyn, under the auspices of the Metropolitan Board of Health in 1866, the nuisance due to the putrefaction of stable manure and its subsequent handling prevailed generally throughout the metropolitan district. It appeared to have been maintained from time immemorial, without any apparent recognition of its unsanitary relations, and it was thoroughly provided for by the structural conditions of the stables and the privileges of the stable-keepers. Indeed, the emanations from stable manure were considered by some people wholesome, and particularly remedial for whooping-cough. But the Board of Health at once undertook to abate the nuisance *while it tolerated the provision for it*—the storage of manure in vaults, areas, and heaps in and roundabout the stables, promotive of its putrefaction. Nevertheless a stringent ordinance (see page 314) was adopted against conditions inseparable from the storage privileges.

That the ordinance should have wholly failed of its purpose, under such circumstances, is surely not surprising to any one who has ever given attention to the subject. Yet in Brooklyn, ever since, as before, 1866, stables have been and continue to be constructed with special reference to manure storage: basement or *cellar* stables—for there are many wholly below the level of the pavement—with area along the outside walls, covered with grating, and vaults under the pavement; into which areas and vaults the manure is raked and packed, and commonly kept until it putrefies, ere it is pitched up upon the pavement and by a second shovelling

into carts, while reeking ammoniacal gases noisome to a large neighborhood. And the carts by which it is taken away are rarely sufficiently covered to prevent constant scattering of the manure along the streets.

The "health" ordinances for the *regulation* of this nuisance are as follows:

"All manure vaults attached to stables where more than two horses are kept shall between April and November in each year be emptied twice in each week, and such vault shall in no case be permitted to become a nuisance.

"That no manure, garbage, or other material that is liable to emit an offensive exhalation shall, in or adjacent to the city of Brooklyn, be turned or stirred (except about its removal) in such way as to be liable, by reason thereof, to increase such exhalations."

How to prevent vaults so used from becoming a nuisance, or how to so stir manure undergoing the process of putrefaction and avoid exhalations, we are not informed.

Every resident of Brooklyn knows that the vaults not only, but the stables themselves are so saturated with putrid soakage, in virtue of the ordinances quoted and the privileges common to them, that they are a stench to the neighborhood, whether they are stirred or not.

Yet the health authorities are supposed to be familiar with the results attributable to manure nuisances, as shown by the British Local Government Board, Health Department of New York, and other sanitary effort. Such results have frequently been the subject of remark in these pages with special reference to the coincidence of Brooklyn's reputation for throat diseases and diphtheria.

The diseases that are thought by the best authorities to be most capable of being cultured and spread by town manure are:

General malaise, vomiting, diarrhœa.
Sore throat.
Diphtheria.
Enteric-fever, and other infective fevers.

COSTLY UNSANITARY HOUSES.—Landlord Roth must pay for the deaths of John Bogert's children. Frederick Roth

has two judgments, aggregating $2000 and costs, to pay, because, it is alleged, he neglected his duties as a landlord. Mr. Roth owns the tenement 769 Amsterdam Avenue, New York. He had as tenants John M. Bogert and his family.

Bogert complained that the tenement was in an unsanitary condition, and it is charged that the Board of Health told Roth to put his house in proper shape, but he failed to do so. In consequence of the neglect of the landlord, Bogert says, his children were taken ill. His son Thomas died April 8th, 1894, and his daughter Jane on the 19th of the same month. He brought suit in the Superior Court against the landlord, and recovered $1000 damages by default in each case.

NEW YORK POLICE STATISTICS FOR 1894.—The total number of arrests was: Males, 77,535; females, 20,950; total, 98,485. There were 5794 arrests for assault and battery, 771 for felonious assault, 767 for burglary, 21,449 for disorderly conduct, 218 for gambling, 130 for homicide, 19,538 for drunkenness, 8623 for drunk and disorderly, 1887 for grand larceny, 3443 for petit larceny, 3640 for vagrancy, 8404 for violation of Excise law, and 7784 for violation of corporation ordinances.

Of the persons arrested, 43,279 were born in the United States, 20,502 in Ireland, 10,401 in Germany, 4468 in Italy, 5919 in Russia, 2675 in Greece, 1604 in Austria, and 470 in China. The arrests of negroes numbered 2295.

There were arrested 154 actors, 178 bankers and brokers, 6359 bartenders, 11 ministers, 5 rabbis, 154 lawyers, 18,089 laborers, 98 physicians, and 18 undertakers. The station-houses accommodated 40,300 male and 28,050 female lodgers.

Two thousand seven hundred and forty-three lost children fell into the hands of the police. All were restored to their parents except 183. These were sent to institutions.

The Central Office detectives made 1286 arrests during the year. Seven hundred and six were for felonies, 370 for misdemeanors, and 200 were of suspicious persons. There was recovered $205,000 worth of stolen property.

Sixty-five members of the police force died during the year, 38 were retired, 17 resigned, 41 were dismissed, and there were 28 promotions.

Property Clerk Harriot handled over half a million dollars' worth of lost and stolen property received from precincts. The sales of unclaimed property realized $550 for the pension fund.

TAMMANYISM IN DETROIT.—"The corrupt conditions in which the municipal affairs of large cities are involved," says the *Physician and Surgeon* of Ann Arbor, "has seldom been more forcibly exemplified than in the conduct of health affairs in Detroit. The political methods of Tammany have been improved upon, and those who have been entrusted with the charge of important sanitary duties have been notable for an ignorance as pernicious as it was invincible.

"Those who deduct moral lessons from contemporary events will doubtless observe with interest that the nemesis which tardily overtook this perfidious institution was ultimately the outcome of its own innate rottenness. It yielded less to assault from without than from decay within. The discovery of the suppressed cases of small-pox was an event which simply indicated the profound and inhuman depths of infamy to which those could descend who had at one time, however erroneously, been deemed worthy of public trust."

"TEMPERANCE" DRINKS.—Dr. James Edmunds, M.R.C.P., Medical Officer of Health, Public Analyst for St. James', and Consulting Physician for the London Temperance Hospital, gives some very interesting facts about the "soft" drinks that are so very popular with some of the total abstainers in Great Britain. It seems he made it his business as public analyst to examine the make-up of these drinks, and in *The Son of Temperance* he is reported as saying: "Many 'temperance' beverages have been found anything but free from alcohol, and the following are given as types: 'Elderberry syrup' contains 8.7 per cent of proof spirit; 'non-alcoholic ginger cordial,' 10 8 per cent; unfermented sherry, 17 per cent, and cowslip wine, 28.9 per cent.

"Report for 1885–86.—Of 425 botanic beers (root beers) and other temperance beverages which were analyzed, more than half contained over the legal 2 per cent of proof spirit, the range extending from a mere trace up to 25 per cent. In

19 of the cases the samples, although represented as non-intoxicating, contained as much spirit as ordinary ale and porter or more. It was stated on the label of a professedly non-alcoholic beverage that total abstainers who consumed it were both pleased and surprised at its comforting and exhilarating effects; and as it contained 23 per cent of proof spirit, the reason was obvious.

"Report for 1889–90.—Out of 262 samples of herb and ginger beers, in 63 the proof spirit exceeded 3 per cent and ranged as high as 13.7 per cent.

"Report for 1890–91.—In 374 samples of herb beer, etc., 154 cases were found to contain proof spirit beyond 3 per cent, 33 cases exceeded 5 per cent, and 2 cases exceeded 7 per cent."

This looks like a decrease in the proportion of alcohol in these "soft drinks," but it shows that no dependence can be placed on them as temperance beverages, and we hope the time may never come when our American total abstainers shall desert their safe and renowned God-given cold water for any sort of man-made drinks whatever, whether of English or American manufacture.

PRODUCTION OF OZONE.—According to foreign chemical journals, the most recent method of producing ozone is that of Lieutenant Poulsen, a Danish officer, and is based upon the oxidation of phosphorus in a special apparatus. A wide-necked glass jar is closed with a finely perforated porcelain plate, and two inches below this there is a similar plate inside the jar. Through the centre of each passes a rod, which is curved upward at the lower end and terminates in a small cup for holding a piece of phosphorus. The jar contains sufficient acidulated water to submerge the phosphorus when the apparatus is not in use, and, when ozone is required, a small quantity of potassium permanganate is added to this, and the phosphorus raised by means of the glass rod above the surface of the liquid. Phosphorous acid is formed by contact of the phosphorus with the air, and converted into phosphoric acid by the action of the permanganate, while ozone is produced simultaneously and escapes through the perforations in the porcelain plates.

DR. JENKINS APPOINTED SPECIAL PATHOLOGIST.—At a meeting of the Board of Coroners, held March 2d, Dr. William T. Jenkins, recently Health Officer of the Port, was appointed special pathologist to the board, without salary. His duties will be to assist in making autopsies when requested, and it is stated that Dr. Jenkins had offered his services gratis.

THE AMERICAN CLIMATOLOGICAL ASSOCIATION.

The next meeting of the American Climatological Association will be held at Hot Springs, Va., June 13th, 14th, and 15th, 1895. This time was chosen to accommodate members of the Laryngological Association, which meets in Rochester the beginning of the following week.

Members desiring to read papers on this occasion will please send the titles as soon as possible to the President, Dr. S. E. Solly, Colorado Springs, or to the Secretary.

J. B. WALKER, M.D.,
Secretary.

1617 GREEN STREET, PHILADELPHIA, March 12, 1895.

FATHER DENZA.—One of the greatest of climatologists was, on December 14th, struck down by apoplexy in the Vatican, in the person of the Padre Denza, founder of the Italian Meteorological Society, and, by special appointment of Leo XIII., director of the "Specola Vaticana." A Neapolitan by birth, Francesco Denza was a theologian by profession, but a mathematician and astronomer by choice. Enrolled in the Order of the Barnabites, he early revealed his scientific gifts, turning his attention to the study of the air currents and embodying some of his most interesting observations in a celebrated monograph entitled "La Climatologia della Valle d'Aosta." His account of the origin and character of the "scirocco" wind—the scourge of the Mediterranean littoral—is also well known; and of late years he had bestowed much thought on the genesis and propagation of earthquakes, particularly in Southern Italy. In fact, a treatise on the subject, all but completed, lies among his posthumous papers, and will, it is understood, shortly see the light under the editorial care of one of his colleagues in Rome.—*London Lancet.*

NEW BOOKS AND BOOK REVIEWS.

ANY BOOK reviewed or advertised in THE SANITARIAN costing $1.50 or less will be sent *free* to any present subscriber sending the name of a new subscriber, or to any new subscriber on receipt of the full subscription price sent on his own account; or any book so reviewed or advertised costing more than $1.50 will be sent at a discount of that amount.

THE FUNK & WAGNALLS STANDARD DICTIONARY OF THE ENGLISH LANGUAGE.

"It embodies many new principles of lexicography. It contains 2338 pages; 5000 illustrations, made expressly for this work; 301,865 vocabulary terms, which is nearly two and one half the number of terms in any single volume dictionary, and about 75,000 more than in any other dictionary of the language. Two hundred and forty-seven editors and specialists, and 500 readers for quotations were engaged upon this work. It cost nearly one million dollars."

ISAAC K. FUNK, D.D., Editor-in-Chief; Francis A. March, LL.D., L.H.D., Consulting Editor; Daniel S. Gregory, D.D., Managing Editor. Associate Editors: John Denison Champlin, M.A., Arthur E. Bostwick, Ph.D., Rossiter Johnson, Ph.D., LL.D. Sold by subscription. Prices: Single volume edition, half Russia, $12; full Russia, with Denison's patent reference index, $14, full morocco, $18. Two-volume edition, half Russia, $15; full Russia, with Denison's patent reference index, $17, full morocco, $22. Funk & Wagnalls Company, New York, London, and Toronto.

All that we said in praise of this work on receipt of the first volume, nine months ago, may be repeated with emphasis as being equally applicable to the second volume, now before us. For besides the continued excellence of arrangement peculiar to it, in the "*order of usage*"—that is, the first aspect of a word, its spelling; second, pronunciation; third, definition; last—by which the objects of reference are greatly facilitated—the *appendix* is alike remarkable for its order and fulness. It comprises: A language key. Principles and explanation of the scientific alphabet. Illustrations, groups, and tables in the vocabulary. Proper names in bibliography,

bibliology, biography, fiction, geography, history, and mythology, together with pen-names, prænomens, etc., in one alphabetical order. Glossary of foreign words, phrases, etc., in English literature. Faulty diction: a brief statement of the principles deciding correctness of usage, etc. Disputed spellings and disputed pronunciations. Abbreviations and contractions. Arbitrary signs and symbols used in the sciences, in commerce, and in typography. Poetical and symbolical significance of flowers and gems. If one wishes to know the meaning or pronunciation of a proper name, and is not sure whether it is a name in geography, history, fiction, mythology, biography, or bibliography, etc., he will not be required to turn to separate glossaries, but, by simply turning to the one alphabetical order, he will find the word with pronunciation and meaning, and will learn there whether it is a name in history, fiction, etc.; and so of all the rest.

In the beauty of its lithographic work of birds, decorations of honor, flags of all nations, gems and precious stones, national coats-of-arms, familiar flowering plants, seals, signal flags, solar spectrum and typical colors; excellence of paper; clearness of type, notwithstanding its necessary smallness; strength and beauty of binding and easy opening—all combined with a vocabulary so full and so accessible as to render it alike useful to the scientist, professor, collegian, or reader. Indeed, in every sphere of learning it is both a necessity and a luxury.

THE PHYSICIAN'S VADE MECUM: Being a Handbook of Medical and Surgical References, with other Useful Information and Tables. By SEBASTIAN J. WIMMER, M.A., M.D., author of "Tables and Notes on Human Osteology;" co-author of "Memoranda and Tables of Human Anatomy;" Member of the Alumni Association of the New York College of Physicians and Surgeons; Metropolitan Medical Society, New York, etc. With additions by Frank S. Parsons, M.D., editor of the Philadelphia *Times and Register*, etc. 12mo, pp. 482. Price, $1. Philadelphia: The Medical Publishing Company.

A rather heterogeneous collection of useful matter, more likely to do harm than good, inasmuch as competent phy-

sicians do not require such books, and those who undertake to treat disease by pocket guide-books ought to be prohibited from practice.

THE FREE-TRADE STRUGGLE IN ENGLAND. By M. M. TURNBULL. Second edition. 12mo, paper. Price, 25 cents. Chicago: The Open Court Publishing Company.

A timely and should be interesting book to Congressmen during the recess. It is a well thought-out practical lesson for statesmen as opposed to mere politicians, who would protect the people instead of the party.

"Growing with what it feeds on, the appetite of Protection, not satisfied with the McKinley Bill, calls for more subsidies and a larger share of the taxes which the consumers have to pay," is a text extracted from the preface commendable to all reflecting minds.

PROCEEDINGS OF THE MEDICAL SOCIETY OF CONNECTICUT, 1894. N. E. WORDIN, A.M., M.D., Secretary, Bridgeport.

An octavo volume of 275 pages, comprehending a dozen papers and reports on curative medicine and surgery, of interest to all practitioners, but very little on preventive medicine.

"Observations during the Vaccination of a Community," by J. C. Kendall, M.D., is a commendable paper to physicians who think vaccination a mere "fool's job," if there are any such—to all who would avoid spurious results and make it effective.

The committee report on legislation also embraces valuable suggestions calculated to increase the efficacy of the medical practice act.

TRANSACTIONS OF THE MEDICAL ASSOCIATION OF GEORGIA, 1894. 8vo, pp. 406. DANIEL H. HOWELL, M.D., Secretary, Atlanta, Ga.

A volume filled with subjects of importance to all physicians devoted to curative medicine, insomuch that, for all that here appears, preventive medicine is wholly ignored. "Castration for Crime," by J. G. Hopkins, is, in one sense, an exception, and considering *the* crime to which the measure specially re-

fers, is certainly worthy of profound consideration by the law-makers, whether it would not be more deterrent to the guilty wretches of such crime, who appear to stand in no fear of death, than hanging, shooting, or burning.

TRANSACTIONS OF THE MEDICAL SOCIETY OF NORTH CAROLINA, 1894. ROBERT D. JEWETT, M.D., Secretary, Wilmington, N. C. Pp. 221.

This medical society is closely related by law to preventive medicine, insomuch that, at each annual meeting, a conjoint session with the State Board of Health is held, at which the annual report of the Secretary of the Board is read and discussed, and preventive medicine considered.

The Secretary's (Richard H. Lewis, M.D.) report at this session refers in particular to the shadow of the cholera scare and the yellow-fever at Brunswick, Ga., in 1893, and the stimulus of these events to preventive medicine throughout the State. Foul drinking-water was made a special subject of inquiry, and by attention to it the prevalence of typhoid-fever was considerably lessened. Regulations for disinfecting, encasing, and transporting dead bodies were adopted; provision made for the payment of local health officers; the relation of malaria to drinking-water investigated; vaccination urged; progress made in the registration of vital statistics, and a general advance in measures promotive of the public health. Dr. Kinyoun, of the United States Marine Hospital Service, was present, and took part in the discussion which followed the reading of Dr. Lewis's report.

And besides, the volume is by no means lacking in papers of interest to practitioners of medicine and surgery, of which there are about a dozen, many important cases cited, committee reports, and discussions of practical importance.

ANNUAL REPORT OF THE BOARD OF REGENTS OF THE SMITHSONIAN INSTITUTION. Showing the Operations, Expenditures, and Condition of the Institution to July, 1893. Washington: Government Printing Office. Pp. 763.

The Secretary, S. P. Langley, calls attention to the desirability of securing an appropriation to meet actual outlays incurred in administering Government trusts. These outlays,

for matters not equitably chargeable to the fund of James Smithson, are increasing; they are incurred in serving purely governmental interests, and are not met by any of the present appropriations. In the line of research the Secretary has investigated in aerodynamics and astrophysics; aid has been given in Professor E. W. Mosley's determinations of the density of oxygen and hydrogen; Professor A. A. Michelson has been assisted in his study of the application of interference methods to spectroscopic measurements; Professor Holden is engaged in lunar photography; and other investigations are reported upon. Mention is made of Mr. W. W. Rockhill's adventures in Thibet and other explorations described in the Report of the Bureau of Ethnology.

CONTEMPORARY LITERATURE.

THE SECRET OF LONG LIFE.—M. Barthélemy Saint-Hilaire, the famous French scholar and politician, who recently entered on his ninetieth year full of physical and intellectual vigor, has been telling the inevitable interviewer how it is his days have been so long in the land. It is, we are told, the effect of strict adherence to the old precept "early to bed and early to rise," with steady work during waking hours. Every grand old man seems to have a secret of his own. Mr. Gladstone, we believe, attributes his longevity to his habit of taking a daily walk in all weathers, and to his giving thirty-two bites to every morsel of food. Oliver Wendell Holmes pinned his faith on equability of temperature. The late Major Knox Holmes swore by the tricycle, which, in the end, was the cause of his death. Dr. P. H. Van der Weyde, an American octogenarian, not long ago offered himself "as an example of the benign influence of the study and practice of music." Some aged persons give the credit of their long lives to abstinence from tobacco, alcohol, meat, or what not; others to their indulgence in all these things. One old lady, says *The British Medical Journal*, of whom we read not long ago as having reached the age of one hundred and twenty or thereabouts, maintained that single blessedness is the real *elixir vitæ*, and she ascribed the death of a brother at the tender

age of ninety to the fact that he had committed matrimony in early life. M. Ferdinand de Lesseps believed in horse-riding. In a letter recently published, M. de Lesseps delivered himself on the subject as follows: "I shall always feel deeply grateful to Larine, my riding master, who from my earliest years made me share his keen passion for horses, and I am still convinced that daily horse exercise has in a large measure been the means of enabling me to reach my eighty-fourth year in perfect health." Mr. James Payn complains that in his boyhood he "got a little bored with too much horse." The Grand Français seems to think that one can hardly have "too much horse." Carlyle was also a great rider almost to the end of his long life, and he not only rode, but, we believe, groomed his horse himself. On the whole, it must be concluded that the real secret of longevity is a sound constitution prudently husbanded.—*Medical Record.*

HELMHOLTZ AND AMERICA.—With America the relations of Helmholtz were close and pleasant; and when he came in 1893 to attend the Electrical Congress at Chicago, the recognition he had given to the work of Rowland, Root, and other American scientific men, was promptly repaid by his election to the honorary presidency of that important body, to assist in the further definition of units and laws, which in earlier years he had been foremost in determining. He was an old man, and it has been hinted that he dragged himself abroad because it was the imperial pleasure. But his letters in response to the official invitations, and his conversations while here, betrayed intense expectancy and delight. His strong practicality also cropped out in the use he made of opportunities, such, for example, as securing from the Edison Electric Lighting Company of Chicago a complete set of all its forms, blanks, and rules for account-keeping.—*Thomas Commerford Martin in the Century for March.*

THE FOLDING-BED.—The sea is not without its hazards, but, after all, an ocean steamer is a safer place in which to repose one's self than a folding-bed. To be swallowed up by the mighty sea is at least a dignified fate which great and good people have met in all ages, but there is no dignity at

all, no decorum, no extenuating circumstances of any sort about being smothered in a folding-bed. There is a tinge of contemptuousness in one's very pity for the victims of such a disaster. There is an excuse for being in the upper berth of a sleeping-car; the exigencies of travel explain that; but is there any good and valid excuse for being (at home, or in one's own hired flat) in a folding-bed? Is the folding-bed a legitimate contrivance? A cot is respectable; the simplest iron bedstead is perfectly decent; but the folding-bed—is it not a subterfuge, a hypocrisy, an unairable pretence which honest people should blush to look upon, and scorn to be in?

Perhaps it is not all these things. Perhaps cramped quarters justify it. Last month it killed the mother of a family in Brooklyn; it shuts up on folks often enough to make the folding-bed accident item one of the most familiar in the newspaper; but it may have friends who have invested money in it, and like it, and are ready to explain that there is as much difference in folding-beds as there is in the people who sleep in them, and that not all of them deserve to be condemned.—*Harper's Weekly.*

HELP FOR CONSUMPTIVES.—Perhaps the founders of the Invalid Aid Society builded better than they knew when, in the year 1892, an association of kind and thoughtful men and women (separating for the sake of pursuing their specific work from another body, the Health Resorts Association of Chicago, with which they remain in friendly co-operation) organized to assist by advice and, as far as possible, by money, in the removal of invalids, chiefly consumptives, to regions favorable to their recovery. This society, now incorporated, has already established or verified important data, and its practical experience has gone far toward solving the difficult problems of helpful climate and inexpensive care, while the mere existence of a reliable bureau of information mitigates the cruel uncertainty attending an invalid's change of abode.—*From "The Service of an 'Invalid Aid Society,'" March Review of Reviews.*

THE DETECTIVE OF FICTION AND THE DETECTIVE OF REALITY, an article by Inspector Thomas Byrnes, in *Harper's*

Young People, for March 19th, will be read with uncommon interest. Another good article in the same number of the *Young People* is a description of the daily life of the little Queen of Holland.

WRITTEN GESTURE.—A little feature to be seen in some writings—perhaps only to be distinguished as a separate gesture by the aid of a magnifying glass—is the tiny stroke that is separately placed above the small *r*, in order to show that it is an *r*, and to thus distinguish it from another letter which resembles the *r* when the latter is made without this little top stroke. At the first glance how insignificant does this little detail appear! But is it really without meaning as a human action? I think not. A man who habitually takes the trouble to make clearer the meaning of one of his symbols, at the cost of a little separate action, is a man who takes pains with his work and who desires to do his work well. This action, trivial as it appears, could scarcely be done by a slovenly or careless person; it is a gesture of minute care and attention—qualities that in one way or another have been of vast service to individuals and to mankind. Thomas Carlyle, for example, showed his minute carefulness by an attention to punctuation that I have never seen excelled, and which has rarely been equalled. . . . The points of contact and of agreement between gesture and mentation which have now been scantily illustrated are too important to be overlooked, and many other examples might be stated. We perhaps find ourselves thinking that we must no longer slight this study of handwriting as we may slight a foolish pastime, but that it deserves to be regarded as a branch of the study of human gesture, by which much knowledge may be gained of the physical expression of psychical conditions.—*From "Written Gesture," by John Holt Schooling, in the Nineteenth Century for March.*

RAREFIED AIR IN MOUNTAIN CLIMBING.—This question of loss of breath at great altitudes cannot, however, be taken as a sure test of the height reached. The state of health of the climbers, and whether they are training in proper or not, whether they have had a sufficiency of food, and the different

states of the weather are very large factors in the comforts or discomforts of an ascent. Count Henry Russell, one of the most experienced of mountaineers, suffered severely on Mont Blanc (15,800 feet), while Mr. Henry Gale Gotch, after an easy ascent of the same mountain, tried the experiment of jumping a number of times over an alpenstock, which he did without any inconvenience whatever — his guide, Henri Dévouassoud, however, confiding to him after a few days his abiding astonishment at so peculiar a mode of resting after an ascent. Mr. Whymper and the Carrels suffered severely on Chimborazo (21,424 feet), while on the other hand Dr. Güssfeldt on Aconcagua reached 21,000 feet without suffering any inconvenience; and Mr. Freshfield's party of six did not suffer in any way from the air, though they almost ran up the last rocks of Elbruz (18,526 feet).—*Edwin S. Balch, in The Popular Science Monthly for March.*

BEAUTIFUL AND EASY PLANTS TO GROW.—The beauties of bedding-plants not only develop in a few days, but are unsurpassed in splendor, because the tropics as well as the northern zone are called upon to add riches to the treasury of color and form. Since bedding-plants are set out from the greenhouse in the warm days of May and June, nearly all of the more tender kinds of plants can be used—palms, cannas, acalyphas, banana plants. And when we have these, we have all the most dominant effects of the tropics, so that we can easily see how summer, hot sunlight, suggestions of the tropics, and the universal love for rich and glowing color all combine to render bedding-plants supremely popular.—*From "Bedding-Plants," by Samuel Parsons, Jr., Superintendent of Parks, New York, in the March Scribner.*

THE ALTITUDE OF JERUSALEM is always a surprise to the visitor who comes here for the first time. He knows, of course, that it is a mountain city, and that it was built upon Mount Zion and Mount Moriah; but he does not realize, until he makes the gradual ascent, that it is about 2600 feet above the level of the Mediterranean, and nearly 4000 feet above the surface of the Dead Sea. As high on the one side as the Catskill Mountain House; as high on the other as the crater of Mount Vesuvius.

Jerusalem is a city of surprises. It is, apart from its sacred associations, an intensely interesting spot even to travellers who are already saturated with the hitherto unfamiliar and surprising charms of Cairo, Athens, and Constantinople. Its size can best be expressed by the statement that the journey round about the outside of its walls may be made by an ordinarily rapid walker in the space of an hour. Its houses are small, irregular in shape, squalid, and mean. Its streets, if streets they can be called, are not named or numbered; they are steep, crooked, narrow, roughly paved, never cleaned, and in many instances they are vaulted over by the buildings on each side of them.—*From "The Literary Landmarks of Jerusalem," by Laurence Hutton, in Harper's Magazine for March.*

THE REVIEW OF REVIEWS for March, in accordance with its custom, discusses the work of the various State legislatures, thirty-three of which were in session during January and February. The *Review's* article gives the results of recent correspondence with officers and members of these legislative bodies in all parts of the country, thus forming a unique contribution to current political information.

TO be a constant reader of *Littell's Living Age* is to keep a mind well stored with the best foreign literature of the day. To have read it all one's life, if one has reached maturity, is to have a knowledge of philosophy, art, science, and literature, which is of itself a liberal education. Current numbers show the same judicious selection, the same agreeable variety, and the same general excellencies which have always marked this unique and sterling publication. The first number in February shows a delightful table of contents: "A Little Girl's Recollections of Elizabeth Barrett Browning, William Makepeace Thackeray, and the late Emperor Louis Napoleon," by Henriette Corkran; "The Queen and Lord Beaconsfield," by Reginald B. Brett; "Treasure Islands in the Polar Sea," with Part III. of "The Crimea in 1854 and 1894," by General Sir Evelyn Wood, G.C.B., V.C., etc. The same issue contains also the first instalment of "The Closed Cabinet," a powerful short story which is concluded in the following number.

Any reader desiring to be in touch with foreign periodical literature cannot do better than subscribe for this invaluable magazine. A prospectus with special offers to new subscribers may be obtained by addressing Littell & Co., Boston.

PUBLICATIONS RECEIVED.

Suggestive Therapeutics in Psycopathia Sexualis, by A. von Schrenck-Notzinct.

History of Higher Education in Rhode Island.

History of Education in Maryland.

Report of Local Government Board, 1892–93.

Report of New York Lunacy Commission, 1892–93.

Pamphlets, Reports, Reprints, etc.

Report of Health Officer, Port of New York, 1893.

Report Canadian Quarantine, 1894.

Report of Cornell University, 1893–94.

Agricultural Reports. Cornell University :

Leaf Curl and Plum Pockets. George F. Atkinson.

Some Grape Troubles of Western New York. E. G. Lodeman.

Grafting of Grapes. E. G. Lodeman.

The Cabbage Root Maggot with Notes on the Onion Maggot and Allied Insects. M. V. Slingerland.

Varieties and Leaf-Blight of the Strawberry. L. H. Bailey.

The Quince in Western New York. L. H. Bailey.

Black-Knot of Plums and Cherries, and Methods of Treatment. E. G. Lodeman.

A Plum Scale in Western New York. M. V. Slingerland.

Anchoring the Kidney, a New Method for. R. Harvey Reed, M.D., Columbus, O.

Cataract, Ripening of Immature. Boerne Bettman, M.D., Chicago.

Cholera, Prevention and Treatment of. Elmer Lee, M.D., Chicago.

Cœliotomy for Bilsteral Pyosalpinx, followed by Appendicitis. Operation, Recovery. F. H. Wiggin, M.D., New York.

Capsulotomy—Immediate, following the Removal of Cataract. L. W. Fox, M.D., Philadelphia, Pa.

Cola acuminata, Pharmacology of. Parke, Davis & Co., Detroit, Mich.

Deformities, Old and Neglected. S. L. McCurdy, M.D., Pittsburg, Pa.

Diphtheria Treated with Antitoxin Serum. F. W. Wright, M.D., New Haven, Conn.

Diseases of the Alimentary Canal. Dr. J. O. De Courcy, Louisville, Ky.

Doctors Factotum. New York Pharmacal Association, Yonkers, N. Y.

Evisceration of the Eye-Ball. L. W. Fox, M.D., Philadelphia, Pa.

Filter of the Water Supply of Lawrence, Mass. H. F. Mills, C.E., Lawrence, Mass.

Food and Drug Analysis. W. G. Tucker, M.D., Ph.D., Albany, N. Y.

Goitre, Cystic, with Cases in Practice. A. B. Deynard, M.D., New York.

Health Officers' Conference, Ann Arbor, Mich. H. B. Baker, M.D., Lansing, Mich.

Hemorrhoids and Treatment. T. H. Manley, M.D., New York.

Hemorrhoids, Bloodless Operation for. *Ibid.*

Hygiene of the Anus and Contiguous Parts. J. R. Pennington, M.D., Chicago.

Hygiene of the Eye. J. W. Fox, M.D., Philadelphia, Pa.

Index Medicus, Nature, Scope, Form, and Method of. George S. Davis, Detroit, Mich.

Insane, Maryland Hospital for, Annual Report, 1894. George H. Rohé, M.D., Catonsville, Md.

Intestinal Anastomosis. F. H. Wiggin, M.D., New York.

Intraligamentous and Retroperitoneal Tumors of the Uterus and its Adnexia. W. H. Wathen, M.D., Louisville, Ky.

Joint Diseases, the Use of Traction in the Treatment of. S. L. McCurdy, Pittsburg, Pa.

Kola. F. E. Stewart, M.D.; F. Stearns & Co., Detroit, Mich.

Kola Illustrated. Johnson & Johnson, New Brunswick, N. J.

Kola Nut. Parke, Davis & Co., Detroit, Mich.

Laminectomy for Paraplegia from Potts Disease ; Tenotomy of Contractured Hamstring Tendons of both Legs ; Amputation at the Hip-joint ; Appendicitis ; Stone in the Bladder ; Suprapubic Lithotomy. F. C. Schaefer, M.D., Chicago.

Mental Inhibition, or Self-Control, and its Relation to Legal Responsibility. Charles Stoner, M.D., Amsterdam, N. Y.

New Instruments. S. S. Bishop, M.D., Chicago.

New York Medical College. E. H. Davis, M.D., New York.

Ohio Pure Food Commission, an Error of. Mariani & Co., New York.

Operative Treatment of Myofibroma Uteri. N. Senn, M.D., Chicago.

Obstetrics and Diseases of Women, Chairman's Address in the Section, American Medical Association, 1894. Joseph Eastman, M.D., Indianapolis, Ind.

Ophthalmology, Introductory Address to Students. L. Webster Fox, M.D., Philadelphia, Pa.

Orthopedic Surgery. S. Le Roy McCurdy, M.D., Dennison, O.

Peritonitis, a Case of Chronic, with Intestinal and Abdominal Fistulæ—Enterorrhaphy—Recovery. F. H. Wiggin, M.D., New York.

Prisons and Criminal Treatment—European and American. Charles Dickens' Prison Fictions, William Tallack, Secretary of the Howard Association, 5 Bishopsgate Street Without, London, E. C.

Raynaud's Disease. Henry H. Morton, M.D., Brooklyn, N. Y.

Rectum, Five Years' Work in Diseases of the. Charles B. Kelsey, M.D., New York.

Ratio that Alimentation Should bear to Oxygenation in Disease of the Lungs. Boardman Reed, M.D., Atlantic City, N. J.

Relation of Static Disturbances of the Abdominal Viscera to Displacement of the Pelvic Organs. J. H. Kellogg, M.D., Battle Creek, Mich.

Reminiscences of Dr. J. Marion Sims. Edmond Souchong, M.D., New Orleans, La.

SANITARY PATENTS OF RECENT DATE.

532,461. Surgical splint. R. Hoppe, San Francisco, Cal. Hinged supporting rods, a locking device adapted to be moved into locked engagement with the hinged joint of the supporting rods, whereby the rods may be readily locked at any angle or unlocked at will, and the splint or supporting plates secured to the supporting rods, said plates having a slidable and rotatable movement upon the said rods.

532,435. House ventilation. I. Allegretti, Chicago, Ill.

533,127. Inhaler and Respirator. J. B. Horton, Brooklyn, N. Y. An absorbent chamber, slotted terminal plug, slotted well plug, valve plug, perforated umbrella plug, valve hood, and exhalation valve.

533,136. Water Filter. W. T. Miller, McKeesport, Pa. Three filter sections of gradually reduced bottom area and superimposed, one upon the other; three inwardly projecting annular bottom flange, with a removable foraminated concavo-convex bottom, and with removable false bottom of porous sheet asbestos; the lowermost compartment having its sides extended downwardly and inwardly, forming a collecting reservoir provided with a central outlet and spigot.

533,523. Feed-Water Heater and Purifier. A. C. Brancher and W. B. Brancher, Danville, Ill. A shell having a water inlet and a stream inlet, a settling basin in the lower end of the shell, and a blow-off pipe extending through the shell and terminating in the settling basin.

534,243. Device for Purifying Air. C. Peters, Brooklyn, N. Y. An air reservoir having an air inlet and an air outlet, a receptacle for purifying material having an air outlet, and having its side walls and bottom air-tight and its top open, an air tight cover for the open top of the receptacle, the outlet of the reservoir being adapted for communication with the interior of said receptacle, a valve controlling the air-outlet from the reservoir, and means for actuating said valve from the outside of the reservoir.

533,896. Process of Treating Garbage. E. Holthaus, Canarsie, N. Y. In mixing a suitable quantity of water therewith to cook the same; secondly, drawing off the fluid grease and the water from the material separately; thirdly, injecting a solvent, stirring the material therewith to dissolve the re-

mainder of grease, and drawing off and condensing the vapor generated from the solvent; and, fourthly, stirring and simultaneously heating the material until dried, and condensing the vapor generated during such drying operation.

533,897. Apparatus for Treating Garbage. E. Holthaus, Canarsie, N. Y. The combination, with the rendering vessel, of a head provided with a distinct series of ports at different levels, and a series of slide-valves having each a series of holes corresponding to one of the series of ports, a chamber fitted detachable over the valves and wholly inclosing the same, and the valves being provided with stems extending outside of the chamber.

533,940. Extractor and Evaporator for Garbage. F. G. Wiselogel, Indianapolis, Ind. An extractor and evaporator, with the retort, of a cellular car for carrying the material to be treated composed of perforated plates, and a bottom formed of perforated removable pipes.

534,067. Filter. L. B. Hoit, Glens Falls, N. Y. A body having inlet and outlet ports, and provided with a central core having openings at its lower end, a porous pocket enclosing said openings with the bottom of the body upon the inside, partitions in said body extending a point adjacent to the top of the body, and a hollow plug having ports at its lower end and diagonal partition separating said ports.

534,498. Filter. G. Descamps, Havana, Cuba. A filter provided with a filtering tank having a cover, for raising and swinging the cover, and a table adjacent to the tank for supporting the cover when swung away from the tank.

535,515. Sewage Disposal. G. E. Waring, Jr., Newport, R. I. A filter having an air chamber, a layer of filtering material above this, and an air retaining outlet located below the filtering medium and adapted to compel the air to pass off through the filter while allowing the free discharge of the effluent.

535,516. Method of Deodorizing Sewage Filters. G. E. Waring, Jr., Newport, R. I. The improvement consists in passing the sewage through a depositing chamber wherein matters in suspension will be deposited on the surfaces of the gravel or other suitable material with which it is supplied, and the subsequent draining of the chamber and the continued forcing

into it of air when it has been drained, whereby the organic matter accumulated therein will come in contact with a constantly replenished supply of fresh oxygen.

535,295. Filter. T. D. Peasley, Bloomington, Ill. A filter comprising a casing, having an internal vertical partition extending up from the bottom of the casing a part of the way to the top thereof, reticulated material extending from the partition to the top of the casing and laterally from the partition to one side of the casing, the chamber thus formed containing filtering material, an inlet opening into the chamber beside the partition and beneath the filtering material, and the upward open tension from the chamber beside the partition and filtering material.

535,322. Automatic Sewer-Flusher. P. B. Donahoo, Oakland, Cal. A sewer and means for flushing the same, of a tilting bucket in the plane of the discharge of the flushing devices, said bucket having a transversed partition for retaining a portion of the water in the bucket to form a trap and a vertical overflow-pipe whereby the bucket is filled.

534,498. Filter. G. Descamps, Havana, Cuba. A filter having a filtering tank having a cover, means for raising and swinging the cover, and a table adjacent to the tank for supporting the cover when swung away from the tank.

535,563. Sewer-Trap. E. E. Krowl and J. Walker, Elmira, N. Y. A trap comprising a body, a diaphragm across it creating passages above it and below it, an inlet-pipe opening into the bottom of said body, and a ball-valve on one side of said diaphragm, normally closing said inlet and the lower passage and adapted to close the upper one and open the lower one with the inflow of water, and to close the lower one when the water is shut off, and avoid siphoning.

535,292. Garbage Furnace. De Haven Lance, Philadelphia, Pa. A cylindrical outer wall, an inner wall, partitions extending from one wall to the other, openings in said partitions, valves therefor, gas or oil jets arranged in front of each partition, and a flue extending from the back of each partition to a stack.

THE SANITARIAN.

MAY, 1895.

NUMBER 306.

HOME SANITATION.*

By MOREAU MORRIS, M.D.

IN a broad sense home sanitation covers the greater part of indoor life. In it we cherish all that is dearest in the family relation. Wife and children are there housed, cared for, and protected.

Men toil in labor, business, or professions, as the case may be, to the end that their homes may be healthful, comfortable, and happy; that while in its sacred precincts they may secure that needed rest and comfort nowhere else attainable.

Mental or physical overtaxation, without healthful rest and relaxation, is sure to result in mental or physical exhaustion. The bread-winner's health is a vital necessity, and the health of his family must be coincident. With good sanitary home conditions the burdens of his life are lightened. He goes to his daily avocations light-hearted, happy, feeling that with the end of his daily toil will come the needed rest. Surrounded with these, whether in humble life or in luxury, he possesses the elements essential to health and prosperity.

On the contrary, with bad or indifferent home surroundings the lives of self and family are in constant jeopardy. Health, that inestimable boon, is courted in vain. Life becomes an almost insupportable burden. Forced to leave those most dear to him in unsanitary conditions, his anxiety weighs upon

* Read at the Thursday evening meeting, March 14th, 1895, under the programme of a series of conferences of those interested in good municipal government, under the auspices of the Nineteenth Assembly District of the City Vigilance League of New York City.

his mind, unfitting him for his duties and oppressing him with the dread of finding his home circle invaded with disease. While his daily life in the open air, or with the diversity of occupation, relieved for the time from unhygienic surroundings, his health may not directly suffer, but sooner or later under these subtle influences—added anxieties—it is gradually undermined. Weariness and discouragement add materially to his unrest and unhappiness. One by one, perhaps, he sees his family succumb to the dread destroyer, unwittingly charging it upon some other than the true cause.

How important, then, becomes good home sanitation!

But, says some carpist, ignorant of the laws of healthy life, why was it that our ancestors were many of them long-lived and more healthy than the present generation, who knew nothing of the new-fangled terms of hygiene, sanitation, microbes, germs, disinfection, fumigation, etc., now so patent to everybody—they lived healthy, happy, prolonged lives?

With Yankee instinct, we will answer by asking him a question:

Did any of that ancestry live under any similar conditions we find in these later days—in houses heated by furnaces or honeycombed by steam-pipes, with scarcely any ventilation, breathing the vitiated air of warm, close bedrooms, the noxious, sulphurous emanations of gas illumination, the poisonous sewer gases eliminated by animal and vegetable decomposition, all of which fill not only our houses, but even our out-door air, impregnated with the offensive effluvia of filthy streets, rows of overflowing garbage receptacles polluting the atmosphere? Did they spend their time in rounds of excitement, in various excesses of parties, balls, theatres, operas, and teas, turning night into day, laying their weary heads upon sleepless pillows, indulging in unwholesome luxuries at unseasonable hours, suffering the untold horro s of chronic indigestion, to become unnerved and physically exhausted by hasty meals, competitive mental activities, railway rushing from town to town, stock bulling or bearing, working in factories, sweat shops, or the thousand and one things that go to limit and destroy almost every chance for longevity? How long, do you think, they could live in this cyclonic kind of life that the present generation manage to endure?

True, our present methods of living are wrong, and hence the sanitarian, the hygienist must necessarily come to the front and sound the note of warning, point out the methods, the remedies, and the preventives that may limit the dangers of our environment. No; they lived in pure air, broad sunlight, with rain baths to wash down into mother earth floating microbes, slept in cool, well-ventilated bedrooms at seasonable hours, ate plain, simple food, worked physically and mentally with even tenor, were not compelled to resort to drugs to obtain sleep nor to combat indigestion. Happy in all the relations of life, with healthful occupations, free from the disturbing cares and anxieties of a crowded city life, it would indeed be a wonder why they should not have lived to a good old age.

But we citizens of a city life are trying to live under very different conditions, housed in unsanitary buildings, crowded into tenements, flats, and apartments, deprived of heaven's pure air and sunlight, compelled to breathe contaminated atmosphere indoors and out-doors, surrounded by bacteria of both kinds—harmless and unwholesome—we must rely largely upon expert sanitarians, whose practical knowledge can teach us how to live, to enjoy health, to prevent disease, and maintain hygienic environments.

Our Houses.—In the country village or town it is possible to secure a good, healthful site with proper surroundings. In the city we are controlled by very different conditions, where ground area almost invariably governs the choice of locality.

Streets and avenues have been graded, sewered, and paved; houses have been built and constructed only with a financial view. Sunlight and free air circulation are but secondary considerations. How many square feet of ground space will our defective building laws allow to be covered on the ordinary city lot with our piles of steel, brick, stone, and mortar? is now the problem of the architect, his main object being to secure as many rent-producing rooms as the limited space will allow.

Sunlight, governed by rectangular blocks, can only enter at the two ends, which must be northerly, southerly, easterly, or westerly, according to the situation in the block. Air circulation must be governed by the same restrictions.

The much-vaunted inner air-shafts prescribed in the construction by the tenement-house law are simply dead-air receptacles—well holes—without free air circulation; shafts for conveying offensive odors from room to room, story to story, through side windows vainly intended for light and ventilation. Even these in the more crowded parts of the city, as well as in the uptown districts, are constructed with the least possible area the building law will allow, and in the tall, many-storied flats and pretentious apartment-houses and tenements of the present day, built in close juxtaposition, very little light and no direct sun-ray can enter. No provision is made for air circulation other than temperature changes produce. Without the two prerequisites—direct sunlight and free air circulation—no dwelling can be considered healthful or sanitarily correct.

Air laden with microscopical infusoria and microbic dust permeates every room, settling upon every article of furniture, clothing, and carpets, inhaled with every breath either to poison and destroy health, or be overcome by other more vigorous non-poisonous antagonists. With the influence of the sun's direct rays and free interchanging atmospheric currents, nature offers her invaluable protection.

No chemically prepared germicide or disinfectant can begin to compare with these in destruction or innocuous diffusion. Without their direct influence plant life is colorless, and will wither and decay; so with human organisms such deprivation exhibits chlorotic, debilitated, diseased, and dying humanity.

Not alone should our dwelling-houses be well supplied with these necessary requisites for health, above ground, but also the underground conditions should not be overlooked. Wet, damp, undrained soil should be carefully avoided, or so prepared that its malign influences could be overcome or prevented. Foundations and superimposed walls over such water-soaked soil, by their porosity, become by means of capillary attraction the direct carriers to all rooms above of that noxious moisture with its germinal poisons.

Malaria, the synonym of animal and vegetable decomposition, the poisonous germs from which enter so insidiously the human system, has here its habitat.

Therefore in the situation and construction, from the laying

of the first foundation-stone to its completion, no point should be overlooked nor means omitted to make the dwelling-house secure from all such unhealthful and unhygienic influences.

The progress of science in the study of cause and effect, in all that relates to the promotion of health and the prevention of disease, has in recent years developed the means by which this desirable end may be accomplished. Architects and builders who through ignorance or design neglect these well-known sanitary precautions should be held criminally responsible.

With the presumption that these sanitary building requirements of thorough underdraining, impermeably protected foundation walls and cellar bottom—if needs there must be one—have been secured, we may now proceed to suggest those other sanitary means and measures necessary to preserve the health of its occupants.

Beginning at the cellar—too much light cannot be secured. It should never be allowed to become the receptacle of household waste. No article of food, animal or vegetable, liable to decay should be stored therein. It should be kept as free from dirt accumulation, of ashes or other refuse as any other portion of the house. It should be daily aired and ventilated by opening to the external air, and every indication of dampness or wet surface should be immediately investigated and corrected. See to it that the main house drain-pipe is intact at every joint; that every waste-pipe connected therewith has no leaky joint or obstructed outlet. Follow the lines of plumbing to the kitchen sink, the bath-tub, the wash-basins; observe the waste-pipe connections, whether provided with proper traps, well jointed; examine the soil-pipe from water-closets, and whether it has been properly ventilated by free outlet extension above the roof; whether all traps of waste-pipes or water-closets have properly adjusted vent-pipe connections with the main vertical vent-pipe. Perfection in all these details is an absolute necessity for health, and if any unpleasant or offensive odors seem to escape in their vicinity, do not be satisfied by using so-called germicides, which are delusive, and simply displace one odor for another. Offensive odors when persistent are beacons of alarm, and should never be disregarded. A peppermint or other rapidly volatile

test should always be instituted when the location of the defect cannot be otherwise discovered.

Heating and Ventilation, to be properly discussed, would require a chapter too long for our present purpose, notwithstanding both are vital to good sanitation.

With our houses heated by furnaces in the cellar, great care should be taken that the cold air-box provides only pure, fresh external air; that no foul or cellar vitiated air should possibly enter the hot-air chamber to be diffused into the dwelling or sleeping-rooms.

The temperature of such rooms should rarely ever exceed 70° F., and it were far better that sleeping-rooms should be under 50° than over, unless good ventilation without drafts can be secured. Sufficient outer covering to keep the body warm is far more conducive to health than a heated, dry atmosphere.

Ventilation, that so common term, yet so little practically understood, means virtually air change. Diffusion or displacement with fresh, uncontaminated air, of such air as has become contaminated by respiration, exhalation, or exhaustion of its due proportion of oxygen, is an absolute necessity to health. Gas-lights consume a large proportion of this constituent, so that a new and constant supply is needed.

Fortunately the difference in weight of heated and cold air produces a natural system of ventilation, the latter displacing the former, which by its rarity causes more or less of a vacuum, which nature abhors; but as we wise mortals are constantly interfering with nature we must, perforce, contrive our own substitutes. Boxing ourselves up in close rooms, to be artificially heated by furnaces, open grates, stoves, or networks of iron steam-piping, excluding the ozonic-laden outdoor atmosphere, we are still compelled, by warning headaches, failing strength, or more serious disorders to accept nature's offer of a few whiffs of fresh air. Yes, we may have it warmed, but better far, that we should by exercise in the open air obtain both plenty of pure air and health.

Care of Rooms and Contents.—So far as it is possible, every room in the house should be exposed daily to direct sunlight and pure external air. Closets should be thrown open daily and contents frequently removed, aired, and all dust shaken

out. Clothing and textile fabrics of every kind need airing, shaking, and dusting, for such are the habitats of infusoria, bacteria, and poison germs. Sun baths in the open air are the best of germicides. It is a well-recognized fact that with the advent of warm weather the consequent opening of windows and doors, the outdoor exposure and diffusion of air in the pent-up domicils of the tenement-house population, the usual epidemics of the contagious exanthematous diseases rapidly subside and disappear.

A recent writer* says:

"The health of a family depends largely upon the cleanliness of the air that is breathed and the purity of the nourishment consumed. Showers wash the atmosphere out-doors and deposit its floating bacteria in the soil, where they are absorbed by plant life, and when this occurs the air becomes pure and wholesome. This natural process has rightly been taken as a suggestion for indoor sanitation, for Nature's examples are usually intended for commands.

"The care of the house inside depends upon watchfulness and persistence of the mistress. Her vigilance must be unceasing and her intelligence well informed, particularly with regard to household sanitation. Dust in the house is always a menace to health, and it is especially dangerous to those whose lungs or throats are sensitive. Even when so fine as to be invisible to the naked eye, it may and often does contain germs of disease that have been left by earlier occupants, or, perhaps, been introduced by our own neglect in omitting to purify and disinfect after an illness in the family.

"Feather dusters and all whisk-brooms for removing dust are abominations. Hangings should be shaken or beaten in the open air, and dust should be wiped from wooden surfaces with a cloth, moistened if necessary. Dry dusting cloths should be often shaken out-doors, or over an open fire, to keep what has been accumulated from being again deposited in the house.

"It is both amazing and appalling to those who have been only partially acquainted with the methods by which disease-producing micro-organisms preserve themselves, to learn of

* Dr. Buchanan, in the *Delineator*, February, 1895.

the rapidity with which they increase in moderate temperature. The coldest weather fails to destroy them, merely hindering or postponing their increase; and they will keep alive in dust for years and years. In fact, no one knows how long they can remain inactive when dried and still be able to do mischief when breathed into the warm moist air-passages of human beings whose vitality is not sufficient to resist them, or whose digestive organs are not powerful enough to consume them. These facts are mentioned to show to housekeepers the importance of absolute cleanliness."

Carpet Sweeping.—Before sweeping carpets should be sprinkled with dampened material, as sawdust, tea leaves, or coffee grounds, to prevent the dust from rising to lodge upon furniture, cornices, hanging pictures, or the side walls, especially if papered, or use a good carpet sweeper, which accumulates and holds the dirt and dust to be thrown into the fire or out-doors. Carpet sweeping should always be done with open windows; corners and dark places should receive special attention; in a word, absolute cleanliness is the guarantee of good house sanitation. Bedrooms need special watchfulness and care. Beds should be entirely stripped of all covers and these exposed to external air and sunlight if possible, mattresses reversed and allowed free fresh air exposure with open windows.

Kitchens should be kept scrupulously clean; no carpets on these floors should ever be permitted; floors need to be scrubbed daily with soap suds; no particles of food, spots of grease, dust, or ashes should be allowed to accumulate; sinks and washtubs should have no enclosure underneath, but be open and visible, with free air circulation to every part.

The waste-pipes and traps of kitchen sinks are very liable to become obstructed by accumulated grease, coffee grounds, tea leaves, and the fluffy ravellings of dish cloths. More or less of these adhere to the inner surface of the traps and waste-pipes, as warm grease rapidly chills and becomes adherent. No amount of rinsing either with hot or cold water is sufficient to dislodge it, and in consequence it undergoes decomposition, becomes offensive and highly objectionable. Its removal must be accomplished with some solvent, otherwise it becomes the nidus for rapidly developing bacteria of a poison-

ous kind. A handful of washing soda with boiling water used daily is a simple and ready solvent, or if necessary, from neglected accumulation, a strong solution of potash in boiling water should be poured into the sink in liberal quantities. It is well occasionally to remove the screw cap on the trap of the waste-pipe and clean it out thoroughly. Potash will saponify the grease, cleanse the trap and waste-pipe from the adherent grease and vegetable deposit, and thereby arrest fermentation, decomposition, and the rapid generation of poisonous bacteria germs. All articles in kitchen use need to be cleaned immediately thereafter, thoroughly dried and aired in the sunlight if practicable.

Roof Gardens or Playgrounds.—If our houses, and especially the tenement-houses, could be constructed with what are termed roof gardens, or children's playgrounds, open, exposed to free fresh air circulation, bathed with sunlight, where children and adults could congregate and inhale a purer atmosphere than they can find in the street, with its polluted air of our city, our death-rate would be reduced beyond question, especially among children under five years of age, that most susceptible and fatal period of youthful life. Experience, personal observation, and mortality statistics prove incontestibly that high temperature, vitiated atmosphere, and improper feeding are the prime factors of excessive infant mortality. A few hours of daily exposure to fresh, pure air has been the means of saving hundreds of infant lives. A few trips on the salt water for a few hours with salt-water bathing and proper nourishment has restored to life and health little children almost moribund.

Removal of Waste.—One of the most important features of house sanitation is the proper care and disposal of waste. This consists of everything that has become useless in the household economy, which it seems desirable and necessary to be gotten rid of. Such may be portions of animal or vegetable food, waste paper, discarded paper boxes, old worn-out clothing, rags, boots or shoes, children's play gatherings, and many other refuse materials familiar to housewives. To remove such beyond the household precincts, is to be rid of microbic dust and dirt, accumulating factors inimical to good sanitation. All such articles as are combustible should be

cremated. Scraps of meat, parings of vegetables, fruit rinds, bones, paper waste—all will readily burn in a brisk fire, by adding small portions at a time ; and fire arrests all decomposition and is absolutely destructive to germs and bacteria.

Other noncombustible articles of *débris*, as tin cans, bottles, broken crockery, etc., may be consigned to the ash can. Old worn-out rags, leather articles, and even worn-out rubbers have a market value, and will find purchasers or collectors willing to receive them. Such waste or discarded articles should never find storage room in the house. Textile fabrics still useful, whether of clothing, bedding, carpets, rugs, mats, curtains, or hangings, should be frequently brought out from seclusion, thoroughly aired, beaten, or shaken, if possible in broad sunlight. No article of this class, and especially any article of clothing that has been worn, used, or been in the sick-room of any contagious disease should by any possibility be stored away in a closet, trunk, or chest without a previous disinfection, fumigation, and out-door exposure for several days. Articles of clothing have been known to communicate disease after having lain in chests or trunks for years. Such is a well-established fact, yet the warning goes unheeded and the idea even scouted. A recent example has come under the writer's notice, where a child became infected with scarlet-fever, and death resulted from its exposure to a winter garment which a nurse had placed in her trunk the year previous, after having been a nurse-maid attending upon another child who had died with scarlet-fever. On the tenth day after this child had been exposed to this garment, which had remained in the trunk since the previous year, it developed the disease. No other exposure had been possible, this child having been especially secluded from contact with any other source of this disease, by unwearied watchfulness and care, its life being one of great pecuniary value to its survivors, as well as from its mother's solicitous affection.

Bacteriology is daily convincing the most sceptical of the danger of neglecting these sanitary precautions. Although we cannot all carry microscopes or become familiar otherwise with the motes that travel in the air we breathe, the water we drink, the food we eat, yet we cannot deny the facts that science daily discloses ; and by these revelations we are in-

structed in the means and methods of prevention, if not of cure. Small-pox, once the greatest scourge of the human family, is now under control. Diphtheria, one of the most fatal diseases of childhood, is now controllable. Cholera, typhus, typhoid, and relapsing fevers and other filth diseases are yielding to the advances of science and preventive measures, and the greatest of these is cleanliness—of personality, of household, of streets, and all public gathering places. It is the best and surest life assurance, better investment than money. Life and health are more valuable than money.

Sanitary Advice.—Guard against bad or improper house drainage, examine the plumbing, see that there are no leaking joints, defective or insufficient traps, or forgotten, open-mouthed waste-pipes, those deadly sewer feeders of noxious gases of decomposition and hot-bed generators of microbian origin.

Water Supply.—Unless this is pure and free from contamination, it is one of the greatest of all sources of danger to health. Fortunately New York has probably the purest water supply—in the Croton water—of any city in the world at the present day.

Its daily examination by the Health Department gives us the assurance of its purity, and any deleterious contamination is at once discovered, its source investigated, and the remedy applied. Reaching us from a great distance, bounding and bubbling over pebbly beds, kissing the bright sun's rays as its sparkling drops absorb the pure ozone of hilltop and mountain air, it comes rolling down hill and vale into that great conduit, miles upon miles, until once again it spreads itself out to rest and bask in the sunshine of the great reservoirs. It has undergone purification by aëration, oxygenation, and motion.

When, however, it is forced into stationary tanks on the tops of houses, its liability to contamination is considerable, unless tightly covered and the whole body frequently drawn off. A sediment will deposit which renders it impure and harmful. The tank should be frequently emptied and thoroughly cleaned of all sediment. It is advisable and recommended that all tank water should be boiled and cooled before used for drinking or cooking purposes. Filters only clarify and remove sediment, but never destroy germs or microbes.

When we leave the city the drinking-water becomes a serious question.

Is it pure and uncontaminated? should be our first concern. Its depth from ground-surface, its distance from all sources of contamination, such as the privy, the barn or stable, the house waste or the pig-sty becomes a matter of serious import. Any drainage from one or all of these, probable or possible, should be noted, and if the location of the well with reference thereto is such that impurities can reach it, its use for drinking unboiled should be rigidly avoided. A distance of one or two hundred feet is no safeguard if the drainage from these outhouses tends in any way toward the well. Underground seams through rock or porous soil usually find their way to the deeper excavation of the well. The many undoubted instances of typhoid-fever from contaminated well-water drank during a short sojourn in the country need no further warning. No suspected water should be used for drinking without first being boiled.

Infectious Diseases.—You are all well aware of the various technical terms by which this class of diseases are known; but all do not apparently recognize the gravity of precautions necessary in controlling their spread, nor the danger of neglecting the sanitary precautions required in their care and during their treatment.

With some diseases, such as pertussis (whooping-cough), varicella (chicken-pox), mumps, German measles, genuine measles, and scarlet-fever, many people have an idea that when they are either of them of a very mild character, they need no special attention and are not communicable, and rarely feel any alarm unless some complication arises which demands skilful medical attention. Some even go so far as to expose their well children purposely, under the common although mistaken idea, that children are necessarily subject to them and the sooner they undergo the malady the better. Now if all children could be guaranteed against serious complications or death, this theory might not be so reprehensible. But there is no warrant for such conclusion. Every disease of a contagious or infectious nature is not only a menace to health, but life, and no one has the right to place another, even their own children, in jeopardy.

Precautions.—Whatever may be the nature of the disease, if of an infectious or contagious character, no time should be lost in providing for its isolation, and its further spread by using every possible precaution. Other children who may be members of the family, and other persons in the family, except the immediate attendant upon the sick, should be rigidly excluded. Too much laxity in this respect is the rule rather than the exception.

The sick-room should be immediately prepared by removing all textile fabrics, clothing, draperies, curtains, and carpets, except such as will be needed for the sick.

The attendant should be provided with a special suit of under and outer garments to wear in the sick-room, to be removed and left in the room whenever it might become necessary to leave it. Hands, face, and hair should be thoroughly cleansed with soap and water, and some disinfectant applied to prevent the lodgment of poisonous germs upon the person for dissemination before leaving the room.

Some disinfecting solution should always be provided in a vessel or vessels, into which all articles of clothing, bedding, towels, handkerchiefs, or rags used for and about the patient should be placed and covered, after which they can be thoroughly boiled and cleansed for further use, if of any value, or if not, they should be burned. During the progress of the disease no person should be allowed to visit in the sick-room, unless it might be a member of the family, who should also be properly guarded by a special dress for the occasion. When the patient becomes convalescent and is ready to leave the sick-room, the body should be well bathed with soap and water with a weak solution of bichloride of mercury (1 to 1000 parts) from head to feet, wrapped in a fresh, clean sheet or blanket, and taken into another room, where a fresh, clean suit can be put on.

Without removing anything from the sick-room, it should be kept closed until it is thoroughly fumigated with sulphurous acid fumes for several hours, after which the windows can be opened and the room thoroughly aired. The bed, bedding, and infected clothing after the fumigation can now be sprinkled with the sublimate solution, the walls, ceiling, woodwork, and flooring—particularly in the cracks—washed

with the same solution and left to air exposure for a time. Such bedding, sheets, pillow-casing, or wearing apparel as it may be desirable to save for further use must now have a thorough boiling and soap suds rinsing, then hung in the open air to dry. Too much care and particularity with reference to everything that has been exposed to the infection in the sick-room cannot be exercised. All this disinfection, fumigation, and subsequent treatment of infected articles, especially of diphtheria or scarlet-fever, will be performed at the disinfecting station of the Health Department if desired, without expense to the party, and such articles as are not desired to be returned will be cremated.

There are some of these diseases which require most careful and special treatment of infected articles, especially scarlet-fever and diphtheria, whose specific bacilli seem to be so diffusable and infective. Isolation and thorough disinfection, the one to be absolute, the other perfectly performed under the direction of an expert, have proved efficient and effectual, both in suppressing and preventing the further spread of the disease.

A very popular fallacy is that mild cases of contagious diseases are not dangerous to others, and every precaution is omitted or ignored; in consequence such diseases spread in every direction. Everybody should understand that the mildest case is equally infectious with the most severe.

There is no guarantee from infection, unless the person has become immune by previous attack of the same disease, and not in all cases is having passed through the same disease a sure protection from a second attack. Persons have suffered from small-pox more than once, and a second attack of measles or scarlet-fever has been often declared. Though these secondary attacks can be considered exceptions to the general rule, nevertheless it is important to understand the necessity of sanitary precautions as equally imperative with the mildest as well as the most severe cases.

"PA, can you tie a knot in this cord?" "Yes, of course." "Can you tie a knot in any cord?" "Yes." "Can you tie a knot in the spinal cord?" "Johnny, go to bed and keep still."

HOUSEHOLD WATER SUPPLY,

AND MORE ABOUT DRINKING-WATER AND MALARIAL DISEASES.*

By J. C. CHASE, Sanitary Engineer North Carolina Board of Health.

THE importance of an ample supply of wholesome water for general use is so universally understood and admitted that it may seem a waste of time to dwell upon the subject. It is corroborated by the fact that, at the present time, none but the smallest cities are lacking a public water supply. Less than a generation ago the largest city of our State had hardly dreamed of water-works, while to-day no less than fourteen municipalities have public water supplies, satisfactory, perhaps, in point of capacity, but some of them of more or less doubtful quality when the question of purity is considered. In using the term *pure* I do not wish to be understood as saying that absolutely *pure* water is desired or expected. Such water, if in existence at all, can be found only in the laboratory of the chemist, and its use would be impracticable even if it was considered essential. A standard of purity has, however, been established for the information of those interested in such matters, and the guidance of those who are intrusted with the selection of sources of supply. The sensible requirements of potable water are that it should be colorless, odorless, and tasteless.

A plentiful supply of wholesome water for the household is a vital necessity. It should be *soft*, on account of its being better adapted for lavatory purposes, as well as for economic reasons; the difference in the amount of soap required by a hard water, as compared with a soft one, is no inconsiderable item in the ordinary household expenditure.

Wells and springs are the most common source of supply for the household in the majority of places. Such waters are generally of a fair degree of purity. They are naturally inclined to be hard on account of taking up a certain amount

* Appendix to article on "Drinking-Water and Malarial Diseases," by Richard H. Lewis, M.D., p. 496, Vol. XXIII. From North Carolina Board of Health Report.

of mineral matter from the earth, but if the well is deep and at a considerable distance from the dwelling, with the surface drainage from the well toward the house rather than the opposite, it may be safe to assume that the well will be reasonably free from organic contamination, or the specific germ of disease. With the ordinary shallow well, in porous soil, and in close proximity to dwellings or farm buildings, it is more than likely that the water derived therefrom is totally unfit for domestic use. It may be palatable, for even sewage-contaminated water presents a bright and sparkling appearance, and the fact that no sickness has appeared in the family for a long time, if ever, may be advanced as evidence that the good quality of the water cannot be discredited, but in spite of all this there is death in the type of well I have described, and in the fulness of time the conditions will be ripe for a visit from the gaunt forms of disease and death. The danger cannot be overestimated of any open well, and particularly of this kind, becoming infected with the specific germ of that much-to-be-dreaded malady, typhoid-fever, and in this manner spread sickness and death where little expected. The last report of the Massachusetts State Board of Health notes an epidemic of typhoid-fever caused by the use of contaminated milk. The laborers in a field which had been fertilized with the contents of a privy that had received the *excreta* of a typhoid patient were in the habit of visiting a certain well, and, apparently, some of the filth from their boots had been deposited upon the loose plank covering of the well, which was used as a cooling receptacle for cans of milk designed for distribution to customers at a later period. It is stated that the cans were submerged in the water, instead of being suspended in the usual manner, and that a leakage took place about the wooden stopper of the can, but any explanation or theorizing as to how *water* finds its way into *milk* would appear to be unnecessary.

In many localities in our State it is perhaps possible to obtain a supply from a spring situated at some distance from the house, and at such an elevation as to deliver by gravity to the place of use. If the spring is deep-seated it will be safe to assume that it is and will remain free from pollution. Whether it is adapted to household use or not, on account of

inorganic impurities, can be quite easily determined and will be most prominently indicated by the hardness of the water.

It is hardly necessary to say that the prospective proximity to the spring of dwellings or tilled fields may have a detrimental effect that should be carefully guarded against. Eternal vigilance is the price of a perpetually wholesome supply of water.

A water supply from running streams hardly merits consideration in this connection, on account of the limited extent it is likely to be used for ordinary household purposes. In general it may be said that a large stream with swift current flowing from a practically uninhabited territory will furnish water of satisfactory quality. The presence of cities on its banks, using it as a drain to receive their sewage and other wastes, would virtually condemn the water without a hearing. The smaller the stream the more suspicious the water will naturally become, and the small creeks and branches would hardly be considered as having any claims worthy of attention unless the surroundings were of an unexceptionable nature.

We may sum it all up by saying that it almost entirely depends upon the local conditions of the water-shed whether the water of a stream can be used with safety for domestic consumption. If a sparsely settled region, where the soil is cultivated to a limited extent only, the organic impurity will naturally be comparatively small and of vegetable origin. Still such supplies require to be zealously guarded to insure absolute freedom from danger, as witness the terrible epidemic of typhoid-fever at Plymouth, Pa., a few years ago. The *excreta* of a typhoid patient some miles from the city had been thrown out on the snow, and the spring thaws had carried it into the mountain stream from which a part of the city derived its supply. The water had been of undoubted purity, coming as it did from a sparsely settled mountainous region, and it was a long time before any suspicion of the true cause of the epidemic was entertained. The part of the town getting its supply from a river of rather doubtful quality entirely escaped the epidemic. This fact, however, should not lead us to put our trust in water supplies of suspicious character, but rather to exercise strict watchfulness over the source of supply, however high its rank as a wholesome water, or how-

ever free it may appear to be from prospective contamination. The case I have just referred to is a striking example of the danger of a good supply being polluted by a specific germ of disease.

In some localities in our State a plentiful supply of water of satisfactory quality may be had from what are known as driven wells—that is, pipes perforated at the point and driven into the ground to the proper depth, the pump being attached to the surface end of the pipe. Of course this type of well presupposes that the mass of earth above the water-bearing stratum is virtually nothing but sand, and where the locality is thickly settled the chances are that the water will be contaminated with organic impurities leaching down from above. These waters are generally cool, of a fair degree of softness, and well adapted for household use. In a sparsely settled locality it is quite probable that the surface impurities would be so small in quantity that they would be eliminated before reaching the ground water level, the sandy stratum acting as a filter of the intermittent type, which the very elaborate and extensive experiments of the Massachusetts State Board of Health have shown to be the kind of filter best adapted for the purification of water contaminated with organic wastes.

Artesian wells—that is, wells deriving their supply from beneath impervious strata—are of such infrequent use in our State that little need be said in regard to them. They generally yield a water reasonably free from organic contamination, but with an excess of inorganic impurity. I do not think it unfair to assume that the majority of artesian wells yield water that is only considered fit for use because no other that is better can be had, to say nothing about those that no stretch of the imagination could credit with supplying potable water.

Rain-water stored in tanks or underground cisterns—preferably the latter—is the most available and satisfactory source of supply in many localities, particularly where the ground water is of an excessive degree of hardness, and running streams of suitable quality are not available.

Rain-water is the softest natural water found, and at a distance from large cities, or after there has been a sufficient fall to clear the atmosphere of the many impurities contained therein, is of undoubted purity.

It is not so palatable, however, as spring or river waters on account of its freedom from mineral matter and lack of aëration, and for this reason would be considered flat and insipid by one accustomed to the waters above mentioned. To maintain the natural standard of purity in the water it is necessary that the cistern be properly constructed in the first place, and due care taken to keep it, with its various appliances, in good order. It should be built in an accessible place, and conveniently arranged for examination and cleansing. The custom of placing it under some building cannot be too strongly condemned. The pump should be at some distance, so that any waste water from various household avocations, that are frequently carried on at the pump, will not be likely to get into the cistern through any possible defects in the original construction. No water should be admitted to the cistern until the roof has had a thorough washing off, especially after a prolonged season of dry weather, and the water should pass through a suitable filtering device. It is also considered advisable to store the rainfall of the winter months only; and with all of the precautions above mentioned it is very desirable that the cistern should have a thorough cleansing each year. I am aware that the precautions I have outlined are more often honored in the breach rather than the observance, but it is only by the frequent reiteration of sanitary truths that we can get a reasonable amount of attention given to them, and it is very fortunate that the human organization is no more susceptible than it is to the insidious attack of disease.

I have not touched upon the matter of determining the amount of pollution in prospective sources of supply, as that properly belongs to the province of the water analyst. I have little confidence in the reliability of the results of various popular "home-made" methods. Suffice it to say that the State has made suitable provisions for doing such service for its citizens, and no reasonable excuse exists for any one remaining in ignorance of the true character of their water supply. It is proper to say, however, that the old idea that one analysis is sufficient to determine the character of a prospective supply is no longer tenable. It is now well understood that frequent analyses, extending over a period of several

years, are necessary in order to express a positive opinion on the subject, and even then it is highly desirable that a careful watch should be kept up continuously.

SUGGESTIONS AND INSTRUCTIONS FOR BUILDING CISTERNS FOR THE STORAGE OF RAIN-WATER.

The most satisfactory form for an underground cistern for storing rain-water is circular in plan, covered with a dome arch ten or twelve feet in diameter and of the required depth to store the desired quantity. The smallest size that is usually constructed contains one hundred barrels, or thirty-one hundred gallons. This quantity would furnish an average daily supply of fifteen gallons for a period of six months. It is considered advisable to have the cistern full by April 1st, and have it of sufficient capacity to last till the fall rains set in; therefore the size will depend upon the prospective consumption, whether it is used merely to store water for drinking and cooking, or is expected to furnish a supply for general uses about the premises, such as washing, watering stock, etc. In the latter case it would be better to provide two cisterns—one of which could be used for storage as the rains occurred and the other be reserved for household use.

The method of construction is shown in the accompanying drawing, and little additional explanation will be necessary. Care should be taken that the bottom be built on compact material, also that the earth is thoroughly packed around the outside of the structure. If built in hard material, such as stiff, dry clay, it may be practicable to make the excavation just enough larger to allow for a course of hydraulic cement mortar between the brick-work and the earth. The brick may be laid in lime mortar, but in that case it will be necessary to thoroughly plaster the structure both outside and in with a good coating of hydraulic cement mortar. The inside should be well and smoothly plastered in any event. The mortar for plastering should be made of pure cement.

The supply pipe from the roof should have the customary valve (fig. 3) for wasting the rainfall until the roof is thoroughly washed, and also after the cistern is full. The water should also be filtered through sand and gravel, from which the loam has been washed out, or charcoal, or a mixture of

all three, before passing into the cistern. The same general method should be followed in constructing the filter as has been detailed for the cistern. The filter should be thoroughly cleaned out and the material washed each year. It is also desirable to clean the cistern, but if the filter has proper care it will not be essential to do it each year. Care should be taken to close all apertures in the cistern in such a manner that vermin, ground water leachings, or any other impurities will be positively excluded. The roots of certain kinds of trees have a great propensity to seek water, and will find their way through brick-work if there is the smallest crevice to give them a chance to force an entrance.

Cisterns are sometimes built partially or wholly above ground ; also rectangular in form with vertical sides and covered with a circular arch. The filter is also frequently built above ground and at a distance from the cistern, the water being conducted thereto in a duct made of brick or by iron or earthen pipe. Great care should be taken in laying this conduit to see that the joints are made perfectly tight.

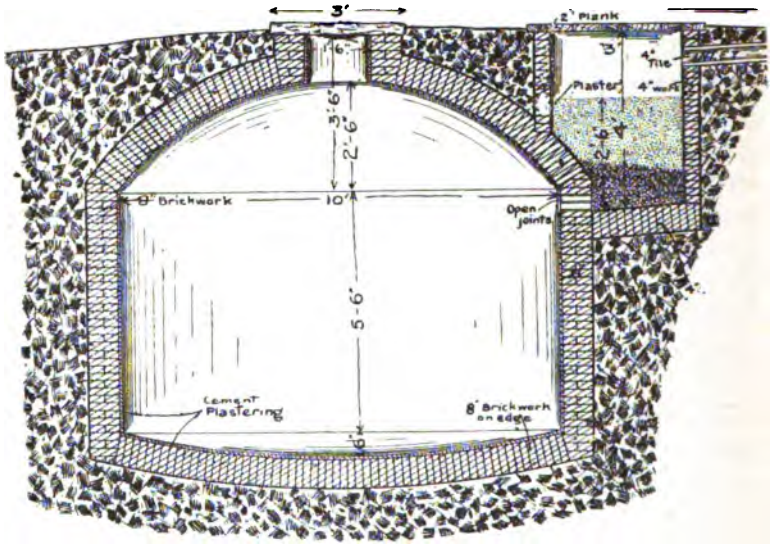
Chain pumps are frequently used for drawing water from cisterns, and have the advantage of thoroughly aërating the water, but as they are necessarily placed directly over the cistern and require a large opening to be made, the danger of contamination from foreign substances getting into the water is greatly increased.

The following is a fair estimate of the cost of a cistern of the size shown on the plan, where the prices of materials are the same as those quoted :

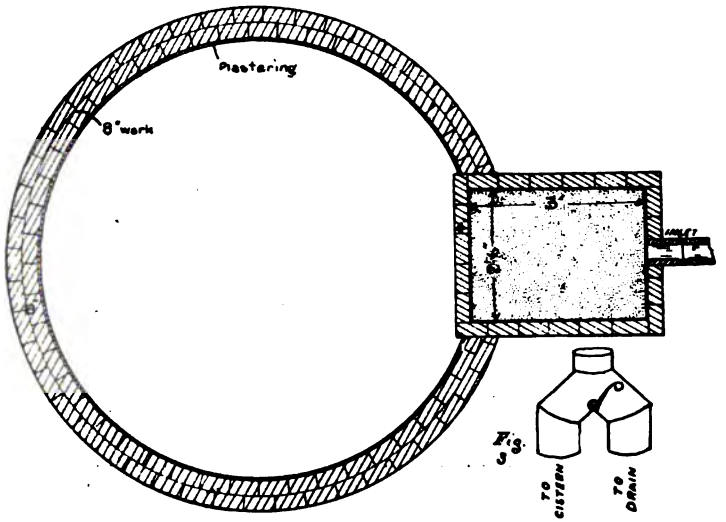
Three and one half thousand bricks	at $8.00.....	$28.00
Four barrels lime	at 1.25	5.00
Three barrels cement	at 3.00.....	9.00
Labor excavating, bricklaying, preparing filter with covers, etc.....		30.00
Total.....		$72.00

The cost of larger ones would be somewhat less in proportion to the size.

After this paper had been read *Dr. Bahnson* said : " Following out the plan outlined this morning, I will say that this is a perfectly informal meeting, and we would be glad to have



Sectional Elevation



Sectional Plan.

all participate in it, and to ask any questions that you feel disposed to ask."

Gentleman in the audience: "Mr. Chairman, I have observed that you all seem to believe that malaria gets into your system through water. Now, in my county here there are a large number of citizens who believe that it is necessary for you to put something into your system to keep the malaria out. You know that we are afflicted with a large number of distilleries here, and I would like to have the Board tell us whether alcohol used moderately or immoderately will put the system into a condition that makes it easy to take malaria or not."

Dr. Battle: "There was a very interesting experiment tried in India some years ago. A regiment of soldiers going through the same campaign was divided into four companies, with a view to telling the effect of the grog ration upon the system; not only grog, but with a view to telling how coffee and tea and water affected the human system. One part of the regiment was put on pure water; a second was put on tea; a third on coffee, and a fourth was put on an alcohol ration. It was not a very fair experiment in some respects, as India is such a very unhealthy country, but the water quarter came out last; the tea people came out first; the coffee people came out second, and the alcohol people came out third. That is to say, tea gave the best results, coffee gave the second best, alcohol gave the third best, and water gave the poorest results. There is little doubt in my mind that a moderate amount of coffee and a moderate amount of tea and a moderate amount of alcohol does tend to protect the system against malarial poison. Of course the trouble is in putting on the brakes. The people in the tropics who take their coffee in the morning are less liable to take the malaria than those who just use the water. If we keep the veins full of good stimulant we are less liable to open wide the door to any malaria. Well, that about answers the question so far as I know."

Dr. Bahnson: "The question is asked whether it is possible to take malaria from ice gathered from ponds where malaria exists. It is not only possible, but it is certain."

Gentleman in the audience: "A day or two ago I saw some-

thing in the paper that was very amazing to me: that water after standing several hours was more wholesome than if it was freshly drawn. I would like to hear some explanation of that."

Dr. Thomas: "One of the things that is always understood in regard to the water supplies of cities is that the water should not only be filtered, but that sufficient time should be given for sedimentation, so that all coarser particles, I mean those that can be seen without the microscope, will have time to settle."

Gentleman in the audience: "I would like to ask Dr. Battle whether the fact that the tea and coffee were boiled did not have something to do with the difference, and also whether the water was boiled or not?"

Dr. Battle: "I don't remember that the water was boiled, but of course the tea and coffee were boiled, but I think that tea and coffee are both very healthful, when taken in moderation. There is hardly a doubt but that the bulk of humanity is benefited by the use of tea and coffee. Of course it is the abuse that brings about the nervous disorders, just as it is with alcohol. I think the experience with alcohol has shown that the human frame cannot stand over one ounce of alcohol a day without injury. But as I have said about the tea and coffee, certainly those people who take in the morning that form of beverage have better health and are less liable to malarial influences."

Gentleman in the audience: "Mr. Chairman, I would like to know if you can give us a simple remedy for testing the water in our wells. It is a recognized fact that some wells have water as clear as a crystal, and as cold as ice, and yet the water is impure. Now we would like to have some means of testing the water in our wells to see whether it is pure or not."

Dr. Bahnson: "You can't tell that by any ordinary means, because the water may taste bad and smell bad, and yet the worst tasting and smelling water may be perfectly harmless as far as we are concerned."

Gentleman in the audience: "In 1872, in Memphis, there was a certain man whose duty it was to go all over the city and order all the wells cleaned out. He would go around and get a bottle full of the water, test it, and the next morning he would tell the owner of that well whether he must have his well cleaned out or not."

SEWERAGE IN FOREIGN CITIES.*

UNITED STATES CONSULAR REPORTS, FEBRUARY, 1895.

INTRODUCTORY REPORT.†

By C. W. CHANCELLOR, United States Consul at Havre.

THERE is no branch of public health so complex, so incalculably difficult to grapple with, as the proper drainage and sewerage of large cities; yet it must be remembered that unless this be efficiently done an ultimate limit is set by man himself to communities, if not to nations.

The soil of many of our cities, saturated with the putrefying contents of cesspools and leaking sewers, emits at certain seasons the poisonous emanations which generate typhoid-fever, yellow-fever, diphtheria, dysentery, and cholera, while the waters of our principal rivers are too often converted into open sewers teeming with pestilential exhalations. The government of every State, whose duty it should be to superintend and watch over the health of the community at large, would do wisely to lay down and carry out an efficient, complete, and common-sense plan of drainage and sewerage for every town and city of the commonwealth.

Were the fearful consequences which result from the reprehensible practice of converting our rivers into open sewers properly understood and properly estimated by the public, no expenditure of time or money would be deemed too great to put an end to a system so disgusting and so destructive to the health and lives of the community at large; but more especially of those whose avocations necessitate their daily and hourly exposure to the evil. Unless this suicidal prac-

* At the request of the Sanitary Board of Savannah, Ga., the Department of State on July 18th, 1894, sent a circular of instruction to the consular officers in the principal cities of Europe for report.

† In transmitting this report to the Department, Consul Chancellor says: "There being no system of sewerage in Havre, and being familiar with the details of the subject, I have deemed it not amiss to treat it in a general way."

tice is abated, by penal enactment, our cities will ultimately become the hotbeds of pestilence and plagues, such as prevailed in the Middle Ages.

Favorable as the site of ancient Rome, extending over her seven hills, might at first appear for habitation and defence, it may be safely said that we should never have heard of the Eternal City, never would she have become mistress of the world if her rulers and people had not early felt the importance of sanitary measures, and carried them out with a persistence and an ability which should serve as models for all succeeding ages. With not only an intention to meet existing wants, but with apparently a prescience of the future greatness and dominion of Rome, the work of drainage and sewerage was begun by her monarchs, and continued during the Republic, on a scale of such magnitude and in a manner so enduring as to be unequalled by any subsequent labor of the same kind in other countries. The "Cloaca Maxima" and its affluxes, or branch sewers, rival the largest of the pyramids in solidity and amount of material, and exceed them all in unquestionable utility. Earthquakes, the pressure of buildings, the neglect of two thousand years have not moved a stone out of its place; and for thousands of years to come these vaults will stand uninjured as to this day. The lesson of the drainage and sewerage of Rome is a fruitful one, and ought never to be lost sight of in the founding and laying out of new towns. In many of these, a proper system of drainage and sewerage is an afterthought, and hence when executed, it is at an immense cost, and often after much sickness, suffering, and mortality among the first inhabitants.

The sewage of large towns and cities consists of the excretal discharges of the inhabitants and of many lower animals; of the foul and contaminated waters of the households, stables, manufactories, and other establishments, and of refuse matters, in a state of decomposition, from markets, slaughter-houses, and other places. The combined quantity of these matters has been estimated at about 7 cubic feet (50 gallons) per diem for each individual, which, for a city with a population of 100,000, rises to the daily average of 5,000,000 gallons, and annually to the astounding quantity of 1,825,000,000 gallons.

To dwell upon the necessity of the immediate and continuous removal of this immense mass of poisonous matter, far away from the precincts of human habitations, or to discuss the disastrous results which must almost necessarily follow their retention in populous communities, would seem superfluous, and yet we find intelligent citizens and legislators, almost everywhere, doubting, hesitating, and procrastinating.

SEWAGE DISPOSAL IN HAVRE.

This fatal procrastination is seen and felt not only in American cities, but in many of the European cities, notably in the picturesque old Norman city of Havre, which has practically no system of sewerage, its sanitation, like its architecture, being still mediæval.

The curse of this city is its polluted subsoil, damp foundations, sodden and tainted basement walls, and sewage-laden atmosphere—the result of defective drainage and sewerage. Many of the streets are unpaved—simply macadamized—which renders surface and underground drainage, if not impracticable, extremely imperfect. The soil in the low-lying sections of the city is always saturated with water, charged with pathogenic matter, and the foundation walls of the houses are in direct contact with the soil. Added to this most unsanitary condition of the dwellings, the atmosphere is poisoned by exhalations from cesspools and privies located either within the area of the building or in the courtyard. Rain and household water runs along the street gutters and empties into the harbor. At times, under the pressure of an epidemic, the music of the gutter rill is increased by a system of flushing, which serves to carry an increased quantity of decomposed organic matter and street filth into the docks or harbor; but even this system of transferring filth from one locality to another within the limits of the city is practised only during the existence of epidemics.

The method of getting rid of excretal matters is the most primitive and dangerous imaginable. It consists in placing small movable receptacles beneath the privy seat into which the excreta fall. When full, these receptacles are removed and carted off in large vans to be emptied and cleaned, being replaced meanwhile by fresh tubs or pails. These vans, laden

with the contents of many privies, traverse the most populous streets during business hours, filling the air with noisome and unhealthy emanations.

To say nothing of the unsightliness of the vans, when moving in procession, they not infrequently stop directly in front of the open doors or windows of dwellings as long as it may suit the pleasure or convenience of the drivers, who seem quite unconscious of the nuisance they are creating. Under such a sanitary *régime*, no surprise need be felt that Havre, with all its natural advantages of location and climate, was scourged by cholera in 1892; by an unusual prevalence of diarrhœal and dysenteric diseases during the summer of 1893; by an epidemic of small-pox in the spring of 1894; and now (August, 1894), by a serious epidemic of typhoid-fever. In England, practical sanitation has reduced the annual rate of mortality more than one half, and in the metropolis to less than 17 per 1000 inhabitants, while in Havre, notwithstanding its admirable situation and unsurpassed climate, the rate of mortality is more than double that of London. For every breach in the simple laws of health humanity must pay its debt, whether in Europe or America.

THE SEWERAGE OF PARIS.

The vast dimensions of some of the Paris sewers do not prevent their being denounced on all sides as unsuited for the work to be performed; the fall is insufficient, the water supply inadequate, and the solid deposits are so great that an army of 1000 men is employed to keep them from becoming obstructed by pushing along the solid matters. It has been found that, unless this course is pursued, the heavier sewage matters will remain several weeks in these underground passages before they reach the outlet, fermenting and evolving gases of the most dangerous character, which accumulate and are liable to be pressed back into dwellings by every downpour of rain, or "flushing," which sends an unusual quantity of water through the sewers, thereby raising the normal level of the sewage flow and lessening the area occupied by the gases.

The city of Paris has more than 800 miles of subterranean pipes, of which about 500 miles are sewer pipes. The largest

of these sewers were constructed at a cost of from $60 to $70 per running metre (39.37 inches); the medium size, from $40 to $50 per metre, while the smallest cost from $15 to $20 per metre. The daily attention to these sewers, with 1000 *egouttiers*, or sewer cleaners, 20 boats, and 50 wagons, cost annually about $800,000, while the entire maintenance of the system and the cleaning of the public ways figure in the annual appropriation at nearly $5,000,000. In addition to existing sewers, Paris is said to be on the point of undertaking a colossal sewerage scheme, the cost of which is to exceed 100,000,000 francs ($19,300,000), which will provide for the treatment of a large proportion of the sewage by irrigation at St. Germain.

SEWERAGE OF OTHER FRENCH CITIES.

Of course, other cities of France are not able to sustain expenditures proportionate to those of Paris, and, consequently, they are deficient or absolutely wanting in any system of sewerage approved by science. Marseilles, with a population of over 350,000, had no sewers forty years ago. The storm and household waters ran along the streets and discharged into the old harbor; but quite recently, under the pressure of epidemics, canals have been projected to convey the sewage waters some distance from the city; Bordeaux (population 225,000), has not more than 30 or 40 miles of sewers in a length of 140 miles of streets; Toulon (population 70,000), like Havre (population 120,000), has scarcely a vestige of sewers. Warned by the disastrous results of recent epidemics of cholera, there now seems to be a disposition among the people of these cities, as well as those of Brest, Lorient, Nice, and other French towns, to seek the best means of making a recurrence of such disasters impossible, and to this end there is a consensus of opinion in favor of building an approved system of sewers in each of the respective cities.

SEWERAGE AND THE DEATH-RATE.

Sir Douglas Galton, the distinguished English engineer and sanitarian, in an address before the Sanitary Institute of Great Britain, said:

"It may be accepted as certain that in every case where

the sewerage of towns has been devised on sound principles, and where the works have been carried on under intelligent supervision, a largely reduced death-rate has invariably followed."

The following examples showing the deaths from typhoid-fever per 100,000, strikingly illustrate the improvement to health following the introduction of an efficient system of drainage and sewerage in certain German and English towns:

Munich.—From 1854 to 1859, when there was absolutely no regulation for keeping the soil clean, 24.2; from 1860 to 1865, when reforms were begun by cementing the sides and bottoms of the porous cesspits, 16.8; from 1866 to 1873, when there was partial sewerage, 13.3; from 1876 to 1880, when the sewerage was complete, 8.7.

Frankfort.—From 1854 to 1859, when there was no sewerage, 87; from 1875 to 1887, when sewerage was complete, 24.

Dantzic.—From 1865 to 1875, when there was no sewerage and no proper water supply, 108; from 1871 to 1875, after the introduction of water, 90; from 1876 to 1880, after the introduction of sewers, 18.

Hamburg.—From 1838 to 1844, before the commencement of the construction of any sewerage works, 48.5; from 1871 to 1880, after the completion of the sewerage works, 13.3.

Dr. Buchanan, medical officer of the privy council of England, in his ninth report, has shown the marked improvement to health which followed the introduction of drainage, sewerage, and water supplies in twenty-five cities and towns, with an aggregate population of 593,736. The average of the death-rates per 10,000 for the different places decreased as follows: Mortality from all causes, from 247.55 to 219.87; typhoid-fever, from 13.34 to 7.8; diarrhœa, from 8.45 to 7.66; pulmonary consumption, from 34.44 to 27.3. Children under one year old, from 55.66 to 50.

On the other hand, it has been clearly demonstrated that improperly constructed sewers have increased the death-rate by exposing people to the direct effect of deleterious gases. Altogether, however, it would appear, from the above figures, that the purifying of the air of towns by the rapid abstraction of refuse matters is no less important, from a sanitary standpoint, than providing an abundant supply of pure water.

DRAINAGE AND SEWERAGE.

The terms "drainage" and "sewerage" are distinct subjects, though, unfortunately, they have come to be used as if they were the same. At one time it was not so. Town "drainage," when first introduced, was intended, as it was practically carried out, only as a means of carrying off from the neighborhood of houses the refuse waters of domestic operations and for the removal of rain or service water, and the refuse of manufactories. So completely distinct from the sewers were drains considered, that in most places, entrance into the drains from the water-closet or cesspools was prohibited under a positive penalty. The result was that, as the water-closets became more and more used, and the supply of water in towns was gradually and greatly increased, the cesspool system became a greater difficulty than ever, and the evils—in the form of still more completely saturated soils, polluted wells and foundations, and cellars flooded with stagnant and offensive fluids—became at last so notorious that a new system became imperative, and in place of connections between the water-closets and the storm-water drains being rendered a matter of impossibility or difficulty, the connection was, in some instances, made imperative. The drains were no longer looked upon as simply a means for conveying the slop water of houses and the surface water of the streets, but were made to convey not only these, but also the excremental matters from houses. Formerly, the so-called drains were permeable, not only admitting water from the surrounding soil to enter them, but they acted in the converse way, allowing their contents to pass from their interior and permeate the surrounding soil. All this has been changed. From permeable conduits they have been made impermeable, or water-tight, so far as practicable, in order to retain in their interior the matters which they convey, and to prevent, as far as possible, such matters passing out to pollute the soil.

It will thus be seen that the two systems of old-town drains and new-town sewers are specially distinct. In many towns, even in parts of London and Paris, the old drains still remain, being made to serve the purpose of excretal sewers, for which they are quite unfitted, giving rise to evils of a character per-

haps less obvious and open to inspection, but not less dangerous, than those arising from the old cesspool system. These drains, or so-called sewers, are but elongated cesspools, and creating, as they must create, a vast amount of foul air in the aggregate, they are certain to act in a way even more dangerous than the old cesspools, for these, being outside the house, any foul exhalations arising from them have the chance of being wafted from the neighborhood of the house by favorable winds, whereas sewers are directly connected with the interior of dwellings by the soil-pipe, so that the foul gases from them are delivered where they are most dangerous, and must necessarily pass through the house before they escape to the external atmosphere, if they escape at all.

In view of all these facts, it is necessary that a well-defined distinction should be made between sewerage and drainage pipes, and that the former should be so devised as to carry off excremental matters and household wastes before fermentative putrefaction takes place, and at the same time, carry off all gases as they are formed, so that such gases be not allowed to accumulate in the sewers until they become dangerous. Any system that will not accomplish this object is, in a sanitary point of view, absolutely defective.

UTILIZATION OF SEWAGE.

"Every living being," says Liebig, "produces in its offal the manurial ingredients, both quantitative and qualitative, required for producing the means of sustaining life. It is the law of the circuit of atoms, each playing a part in a long-stretched series of acts of nature, serving consecutively various purposes, and beginning the series anew each time the circuit is completed. Thus, the dung of cattle contains all fertilizing properties needed for growing their food, while that of carnivorous animals supplies the manure for producing the food of the creatures on which they prey; and so it is with every living being, including man."

Hence it is that the nitrogen, phosphoric acid, potash, and other organic and inorganic matters contained in the excretal sewage of cities will suffice for producing food for the people it is derived from.

The following analysis, furnished by the late Durand-Claye,

after ten years of careful investigation, gives the average composition of sewage water per cubic metre (1 metre = 39.37 inches), taken from the outfall sewers of Paris :

Description.	Quantity.	Description.	Quantity.
	Grams.		Grams.
Nitrogen	45	Soda	85
Phosphoric acid	19	Magnesia	22
Potash	37	Organic matters	678
Lime	401	Mineral matters	893

From the foregoing, it is quite evident that the sewage of towns, even when largely diluted with water, is a fertilizer of some value, and the point to be settled is whether it can be conveyed to the land at a cost which will render it permanently valuable to the farmer. If the system of tubular house drains leading to sewers, and these again to streams or rivers, is to be carried out, then it is clear that on the one hand we commit a great waste, in an agricultural point of view, by throwing needlessly away that which, beyond all doubt, contains a comparatively large quantity of fertilizing materials, useful for certain crops ; and, on the other hand, we commit a great wrong, in a social and sanitary point of view, by polluting our streams and rivers, poisoning the very sources from which we obtain the water useful for household purposes, or making our rivers huge open cesspools, flowing past or through our towns, and sending forth from day to day the seeds of death and disease.

Victor Hugo, who enriched literature with so many great works, uttered a timely and eloquent truism, applicable not only to Paris, but to the civilized world, when, in " Les Misérables," he said :

" Science, after groping for a long time, knows now that the most fertilizing and effective of manures is human manure. The Chinese knew this before we did ; not a Chinese peasant who goes to the city but brings at either end of his bamboo a bucketful of what we call filth. Thanks to the human manure, the soil in China is still as youthful as in the days of Abraham, and Chinese wheat yields one hundred and twenty-fold the sowing. There is no guano comparable in fertilizing

properties to the sewage matters of a city. To employ the town in manuring the plain would be certain success, for if gold be dross, on the other hand, our dross is gold. . . . We send, at great expense, fleets of ships to collect at the southern pole guano of petrels and penguins, and cast into the sea the incalculable element of wealth which we have at our door. All the human and animal manure which the world loses, if returned to the land, instead of being thrown into the sea, would suffice to nourish the world."

GENERAL PRINCIPLES.

In sewerage, controversy has frequently been found to be excited upon those very details of the art which appear to be most simple and the most readily deducible from observation, while the proper ground for discussion, in which it is really urgently needed, in order to determine general principles and mark out leading rules, has been left nearly or quite unoccupied. Thus the form, size, and thickness of sewers have received the most elaborate investigation, and provoked an expression of the most widely different opinions, while the great question of the most healthful and economical disposal of the refuse of towns has apparently remained unsought and unasked. Mr. Drysdale says:

"Misled by an instinctive adoption of obsolete plans, we have been content to build sewers, patch upon patch—add length to length of sluggish sewer or practical cesspool, without any principle of arrangement according to which the entire system should be laid out, in order, it may be, to maintain ancient outfalls."

The practical question is, How is the sewage of our towns to be treated, as treated it must be, if the health of the inhabitants is to be considered? The methods of treatment are disposal, other than those involved in the system of *tout à l'egout* (sending everything into the sewer), if this, indeed, may be considered a system at all, and using the sewage in its normal condition and full quantity for the irrigation of land, are pretty numerous and of great diversity of detail, as regards their *modus operandi;* but numerous as they are, they all come under one of the following classes:

1. Keeping the rain or storm water in drains distinct from

those conveying the sewage proper; the rain-water to be passed to river or stream.

2. Dealing with the excreta and household waste in a special way, altogether separate and distinct from the street drains or storm-water sewers.

3. Precipitation or filtration, by which the solid organic and putrescible portions of the sewage are deposited in a solid form, which can be used as an ordinary manure, passing the liquid portion in a condition more or less clear and free from putrescible matter into waterways or upon the land.

4. The pneumatic or aspirating process, by which the excremental matters and household wastes are forced or drawn through air-tight pipes as soon as they are formed, by pneumatic suction or pressure, thereby preserving them in a concentrated condition and in a more highly valuable form as a fertilizer after precipitation, or for irrigation purposes.

MODERN SEWERAGE SYSTEMS.

1. *The Combined or Water-Carriage System.*—This system exists in nearly all English towns of any size; also in Paris, Brussels, Berlin, Frankfort, Hamburg, and a few other continental cities. It consists in treating all sewage, rain-water, subsoil water, household and manufacturing wastes alike, by conducting them off in one and the same conduit, a large volume of flushing water serving as a means of conveyance and to prevent sliming of the inner surface of the sewer walls, so fruitful of the production of poisonous gases and pathogenic germs. This, in a word, is the *tout à l'egout* system, which has been hotly assailed by many distinguished engineers and sanitarians both in Europe and America, on the ground that every addition of the moving or flowing force of the sewage matter, obtained by increasing the quantity of water, must of necessity decrease the value of the sewage as a fertilizer, and in a like ratio, increase the difficulties of its final disposal. From a sanitary standpoint, Dr. Van Ovenbeck de Meijer, Professor of Hygiene in the University of Utrecht, Holland, thus pointedly says:

"I cannot conceive how sanitarians venture to say that in sewers running only one half full, containing fecal matter, and

connected with atmospheric air, there is not a good condition for the growth of germs of disease, or how engineers can overlook the fact that the 'water carriage' system leaves entirely unsolved the important question, What to do with the sewage without involving danger to health? Every main sewer not completely and constantly filled is dangerous to health, and all sewage containing fecal matter is a danger to health wilfully created. Fecal matter should never be mixed with other wastes in the centre of population."

As a health measure, the combined, or English system, is now almost universally condemned as absolutely and irreconcilably in conflict with the requirements of modern civilization and the teachings of sanitary science. In London, where the system exists in its greatest perfection, it has been found to foul both air and water to such an extent that some supplementary arrangement is deemed necessary, and propositions to this end are now being discussed. In Paris, where the system prevails to a great extent, typhoid-fever has become endemic, killing from 1000 to 3000 persons annually; and the epidemic prevalence of cholera at Hamburg in 1892 would seem to indicate a widespread aërial poisoning, in addition to the polluted water supply.

The weight of testimony against the water-carriage system, or the *tout à l'egout*, and in favor of a separate canalization for excretal and household sewage is so overwhelming that nothing could be more conclusive as to the evils of the one and the value of the other.

2. *Pneumatic Systems.*—The problem of rendering cities healthful by the rapid removal of excremental matters and household wastes, is, in a measure, solved when we can get rid of such matters without any possible connection between them and the surrounding air and soil. The advantages of such a system may be briefly stated as follows:

(*a*) It prevents the emanations which a protracted stagnation of excremental matters will give rise to, when the dejections are deposited in cesspools or are allowed to decompose in large water-carriage sewers.

(*b*) It prevents the introduction of dangerous matters into sources of drinking-water and into the surrounding earth, and thereby greatly lessens the danger of epidemic diseases being

transmitted through infectious germs contained in fecal matter.

(*c*) It secures the rapid removal of all excretal and household sewage in a manner to satisfy the requirements of health and economy, and in a condition to render its subsequent utilization as a manure not only possible, but easy of accomplishment.

Several pneumatic systems of sewage have been experimentally applied, each in harmony with suggestions made by M. Belgrand, Inspector-General des Ponts et Chaussées, and Baron Haussman, Prefect of the Seine, as far back as 1861. Both of these distinguished engineers recommended that the excretal sewage of Paris should be conveyed from the houses by a network of metallic pipes leading into special air-tight tubes which would convey the matter rapidly to a point outside the city, where it could be treated or disposed of for agricultural purposes.

The application of a pneumatic system for the discharge of sewage matters was proposed at Paris in 1862 by Aristide Dumont, but it did not succeed. The idea was reproduced in 1872 by Captain Charles T. Liernur, a Dutch-American engineer, who suggested another method of discharging excretal sewage by aspiration. This method, known as the Liernur system, was introduced in parts of Amsterdam, Leyden, Dordrecht, and, to a limited extent, at Prague and Hanau, but the system has not been further developed, owing, no doubt, to its excessive expense, and its limited application to the purposes in view. Finally, in 1878, a French engineer, M. Berlier, in charge of the sewage works at Lyons, substituted for movable vessels a subterranean iron conduit, through which the excretal sewage, from a certain point on the quays, could be drawn by aspiration to the works, a distance of 3 kilometers (about 2 miles). This plan, however, does not seem to have been extended in Lyons. In August, 1881, the Municipal Council of Paris authorized the installation of the system in two districts of the city. After ten years of trial it has not been extended, nor has it been introduced in any other city, for the obvious reason that, like the Liernur system, it is not designed to deal with more than 1 per cent of the sewage—viz., the excretal sewage.

What is needed is a pneumatic system that will deal with the whole of the soiled waters from the house, leaving only the surface or storm-water to be conveyed off through an independent channel.

3. *The Shone Hydro-Pneumatic System.*—Perhaps the nearest approach to a system of sewerage which fulfils all the essential conditions for the removal of household sewage, required by a due regard of the laws of sanitation, is a combination of the water-carriage and pneumatic principles, introduced to the public by Mr. Isaac Shone, an English engineer, in 1872. It may be briefly described as a system of distributing stations for the lifting of sewage, worked from one central station by means of compressed air, whereby the whole of the drainage area is divided into a number of compact districts, each with its separate outfall, and discharging into one common main leading to the ultimate common outfall.

The system enables town authorities to successfully drain flat, as well as undulating, surfaces, and to lay the gravitating sewers at good self-cleansing gradients, in shallow, and consequently, inexpensive trenches. It also admits of the very smallest sewer-pipes which it has been found practically safe to lay down in order to prevent chokage from sewage proper, being used in the lowest as well as the most elevated town areas. Such sewer-pipes can be laid, even in the flattest districts, at gradients steep enough to render them self-cleaning, with the minimum of flushing power.

The Shone system has been in successful operation for the past fourteen years at Eastbourne, England, and as the town area has been extended new installations have been put down from time to time, without interfering with the efficiency of the system. It is also in operation in at least fifty other places in England, including Southampton, Warrington, Preston, Hastings, parts of London, and in many towns abroad, including Karachi and Bombay, India, and Kieff, Russia; but probably the best idea of the objects and scope of the system may be conveyed by a brief description of the sewage works which have been carried out upon this plan at Rangoon, Burmah.

Rangoon is situated on the banks of a tidal river some 35

miles from the sea, and is almost a perfect level. The town was built, some years ago, upon land reclaimed from what was nothing but a swamp, wholly covered at spring tides with water, and the subsoil consists of soft river mud. Under such conditions, the construction of the combined or English water-carriage sewers would have been not only impracticable, but most unsanitary.

The city of Rangoon covers an area of 13,312 acres (31 square miles), and according to the census of 1891, the population was 180,324, but the population of the area thus far accommodated by the Shone system is about 100,000, occupying about 6000 houses. It is contemplated to extend the system from time to time as occasion may require and circumstances permit.

The city proper is divided into twenty-two sections or districts, and within each of these districts is placed a Shone hydro-pneumatic ejector station, containing two ejectors, each of 200 gallons capacity. The sewage of each section or district is conducted by 6-inch diameter gravitation sewers, laid at steep inclinations, into the hydro pneumatic ejectors. The power that expels the sewage out of the ejectors is compressed air, produced at the air-compressing station, which is supplied to each ejector by a small cast-iron pipe. This pipe is connected with an automatic valve, fixed on the top of the ejector. The compressed air is automatically admitted when the ejector is full of sewage, and, pressing on the surface of the sewage, drives the entire contents before it. The mode of distributing the compressed air to the various ejectors is very similar to that adopted in distributing coal gas for lighting purposes.

The outfall of the whole of the sewage is the Rangoon River, and the sewage is discharged at a level of 3 feet below the lowest tide. The cost of the sewage scheme was a little over $800,000, or about $8 per head, which compares favorably with the cost per head of sewerage works in towns having the "combined" gravitating system, some of which are as high as $40 per head of the population.

The annual working expenditure is given in the municipal returns for the years 1892–93, as follows: Establishment, 14,834 rupees; cost of fuel, 9500 rupees; total, 24,334 rupees,

which, at an exchange of 4 rupees per $1, is equal to about $6000 per annum.

The health officer of Rangoon speaks highly of the system, and the fact that the death-rate has been reduced from 53.06 in 1890 to 33.89 in 1892, is a fair indication of the success of the drainage operations.

A pneumatic ejector is placed in a brick chamber, underneath the street, at the junction of four streets, into which the sewage of the adjacent district gravitates by proper sized stoneware sewers, sufficiently well graded to render them permanently self-cleansing. The ejector station is practically the "outfall" of the district with which it is connected, and the district is as effectually separated from the other parts of the town, so far as its sewage is concerned, as if it were delivered to an entirely separate destination. This will prove an important feature in localizing and dealing with the causes of infectious diseases.

Among the advantages of dividing a town into separate sewerage districts, besides those already pointed out, are:

1. That it enables the sewage to be carried in small pipes of short lengths and with good gradients, thus avoiding those large spaces for the accumulation of sewage gas, which constitute the great evil and danger of the old system.

2. As the sewers are laid at good gradients, the sewage flows quickly, and, consequently, has no time to decompose before it passes into the ejectors and is delivered thence into the sealed sewage main. Once there, it has no contact with the atmosphere until it reaches the ultimate outfall.

The compressed air for actuating the ejector is produced at some central station, and conveyed in iron pipes laid under the streets to several ejector stations.

SEWAGE DISPOSAL.

The chief, if not the only, source of manural value in town sewage is the excreta of the population. All other matter is useless from a money point of view, and is likely to be prejudicial to the land. At all events, the matters, in town sewage other than excretal matters, if not positively injurious to land, are certainly not necessary or desirable. The saline matters of the excreta resemble the saline matters taken

from the land by plants, and alone are useful under ordinary circumstances.

Evaporative Methods.—No process which depends upon the application of artificial heat can meet with any degree of success, (1) on account of the expense it entails, both for fuel and labor, and (2) on account of the offensive odors invariably given off. The removal of the water or sewage by evaporation is infinitely more complex than the simple evaporation of clean water in a boiler, which, under ordinary circumstances, good fuel will evaporate from seven to nine times its own weight. So high an evaporative efficiency is impossible with sludge, and it is more than probable that not more than one third such effect has ever been attained.

Chemical Precipitation—The objection raised to chemical precipitation is that, no matter what special reagent is used, the ultimate difficulty is the same—usually the disposal of the accumulations of sludge, which contains from 90 to 95 per cent of water. In a paper read before the Institute of Civil Engineers, London, Mr. Norman Bazalgette, the author, stated, as an objection to chemical precipitation, that "it is impossible to manipulate the enormous accumulations of sludge necessarily incident to treatment by chemicals;" and, further, that when chemical treatment preceded natural filtration, "the accumulation of sludge is an objection insuperable from the use of chemicals."

Land Irrigation.—No one who has studied the subject of sewage disposal can deny that the right way to dispose of town sewage is to apply it to the land. It is only by such application that the pollution of rivers can be avoided; and, when the local circumstances are favorable, this may be done with more or less profit to the town. But to accomplish this successfully the household sewage must be kept entirely separate from surface drainage and rainfall, because in dealing with a less bulky and less diluted material, the process of purification and disposal are rendered much simpler and less costly. For this purpose a separate system of surface drainage must be provided which will carry off the whole of the rainfall, which may be passed into water courses without any special treatment. It would be quite impossible to deal with the whole or any considerable part of the rainfall over a large

city by any process of irrigation, for there are times when the enormous quantities of storm-water coming down the drains and mixing with the sewage would waterlog any ordinary irrigation area, however perfect the process might be of dealing with a certain amount of household sewage on a certain area of land.

The drawbacks and difficulties attendant upon any system of irrigation may be said to consist principally in the volume of sewage to be treated. The efficiency and the economy of the process of irrigation are generally in an inverse ratio to the volume of sewage to be treated. There may be little difficulty in dealing with the sewage of a small town, but in dealing with that of large and densely populated cities the circumstances are materially different and the difficulties incalculably greater. In the first place, land cannot usually be obtained in the neighborhood of large cities of sufficient extent and quality to absorb the sewage matters when diluted with a large volume of surface and storm-water. This may be safely accepted as the rule when we consider that one acre is required in ordinary broad irrigation for every 30 or 40 individuals of the population.

By the more scientific process of "intermittent downward filtration" it is said to be possible to apply sewage diluted with surface water to one acre of land for every 1000 of population, but it is extremely costly to lay out and prepare the land for such a purpose. Mr. Baldwin Latham, the well-known English engineer, referring to the process of intermittent filtration, says:

"I have a case at present in hand at Menton for the Croyden Rural Sanitary Authority, where we apply the sewage of 1000 people to an acre of land, but that land has cost more than £300 ($1500) per acre to prepare it, in addition to the original cost of the land."

Of course, if surface and storm-water be excluded, and the household sewage conveyed to the irrigation fields through a separate system of pipes, by aspiration or air pressure, such as has been described in connection with the Shone system, the cost would be lessened in proportion to the decrease in the volume of sewage water to be treated. This plan is rapidly growing in public favor, and will most probably be

adopted as the general system for sewage disposal in European cities.

GENERAL CONCLUSIONS.

1. That the proper disposal of sewage involves the beneficial appropriation of refuse matters, so as to make them actually productive, avoiding interference with the domestic uses of inland waters for which they are properly adapted.

2. That sewage matters should be made available for agricultural purposes, and the results in this respect are limitable only by considerations of expense as weighed against the value of the result.

3. That there exists between the air of water-carriage sewers and the external atmosphere a constant interchange, and as is the air of the sewer, so will be the air of the street.

4. That excremental matters and other household sewage ought to be rigidly excluded from all storm-water sewers.

5. That all unhealthy putrescible matters should be removed at short intervals from centres of population by means of pipes practically air-tight.

6. That in every respect the best results in the ultimate disposal of sewage have been obtained by irrigation, when the sewage matter is not diluted by flushing or storm-water.

C. W. CHANCELLOR,
Consul.

HAVRE, August 18, 1894.

SANITARIUM FOR CONSUMPTIVES.—At Liberty, N. Y., there will soon be built a new rural retreat for consumptives, for which purpose $20,000 has been contributed by Mr. J. Pierpont Morgan. The location has a high reputation for salubrity and attractiveness. Its easy accessibility to a large population, needing a sanitary retreat less remote from the metropolitan district than are the Adirondacks, will tend to build it up even more rapidly than that on the Saranac.

HYGIENE IN MEDICAL EDUCATION.*

By Dr. J. I. Desroches, Editor-in-Chief of the *Popular Journal of Health*, Montreal; Member of the Board of Health of the Province of Quebec, etc.

To speak of hygiene in medical education before the American Public Health Association, composed as it is of members enjoying so distinguished a reputation, is to undertake a difficult task; but I rely on your indulgence.

The doctor's true sphere of action is not confined to disease alone; it embraces man's whole life in a state of health as well as when indisposed; for health, even like disease, has its laws. It is a matter of consequence that the physician should know how to preserve the first as well as he does how to treat the second, for he must not only cure the patient, but also strengthen him and protect his health, which can be done only by leading a life in conformity with the rules of hygiene.

Hygiene is as essential to the healthy as it is to the sick and convalescent. If many diseases arise from violating the rules of hygiene, the same cause may aggravate or render diseases incurable. In our own days do we not see the number of avoidable diseases increasing, while the progress of science and the means of preservation also increase in number and power? Can it not be proved that there is a constant diminution of these diseases before the wonderful march of hygiene and of civilization?

Hygiene has conquered public opinion; to-day it is considered as one of the indispensable acquirements in the education of the people. At the present moment no person can contest its humane importance and civilizing influence, which have reached such a degree that this science has attained the point required to become a social institution, an administrative power. Under its *labarum*, which presently waves over all civilized people, thousands of savants of all classes have assembled, all disposed to labor in the development and diffusion of this science. In this grand army of hygienists physi-

* Read at Montreal Meeting of the American Public Health Association, September, 1894.

cians represent the infantry—that is to say, the principal corps—that which directs the battle and leads on to victory. It cannot be otherwise, because hygiene is the synthesis of medical science. Physicians shall always hold themselves bound to accord the freest welcome to chemists, engineers, architects, economists, moralists, and statisticians, because these are skilled men, useful in the advancement and application of hygienic principles.

The general interest which inspires modern hygiene, the ardor with which people throughout the land engage in it, the noble *rôle* which physicians are called to fill in this humane movement becomes more important every day; the place that this science has taken in medical instruction in France, in Germany, and elsewhere compels us to fearlessly consider the point we Canadians must arrive at to give this science due prominence in the faculty of medicine—that is, assign it a place in matter of examination for the degree of doctor.

Public interest and medical honor demand hygienic instruction more in conformity with modern progress. It is time for the faculties of medicine to consider the medical profession as an extremely powerful lever in hygienic operations, and a means to diffuse this humane science within reach of the masses. So long as hygiene is ignored by the greater number of physicians, its individual and social value shall be contested; there will always be quite a large number of families who shall consider it as something troublesome and oppressive.

The doctor is one in whom families confide; his duty is to preserve the health and life of the people; he enjoys general confidence, and, in times of epidemic, he exercises great influence in society. In possessing a sufficient knowledge of hygiene, the physician witnesses the utility of this science among the masses; he understands the *rôle* assigned him by the principles of hygiene in the struggle against infectious diseases and against the progress of epidemics; he makes it his duty to utilize practical sanitary appliances because he knows that public health is a matter of the first importance to a nation, and that he (the physician) is the chief person charged with its preservation.

The physician needs the enlightenment of hygiene in the exercise of his profession; for hygiene occupies the first place

in the treatment of diseases, particularly virulent, miasmatic, and pestilential diseases. In these conditions hyigene and medicine render mutual assistance at the bedside of the patient; hence the obligation for every physician to study the science of hygiene and to take cognizance of its progress.

It is an incontestable fact that one third of the deaths in the Province of Quebec to-day is occasioned by avoidable diseases, and this is a consequence of ignorance on one side and a lack of confidence in applying efficacious hygienic powers. A more complete knowledge of the teachings of hygiene, more rational ideas on the nature and cause of diseases would establish a more evident amelioration in the conditions of existence, and consequently a greater diminution in the morbid causes which exert an ominous influence on our people. To arrive at happy results there must at first be introduced into the education of all physicians in the future a profound knowledge of hygiene; they must understand its high aim, its programme embracing all the aspirations of humanity, with all its tendencies to physical, intellectual, and moral perfection which is combined in the one word "progress."

In preventive as well as curative practice a knowledge of the cause of diseases is essential. That every rational system must be based on this point is evident. Real and important results can be expected only from observation and scientific deductions. The progress made during the last few years in physiology, hystiology, and pathology; Pasteur's fine discoveries, which have so recently developed the question of infectious diseases and their prophylactics, are well adapted to excite our enthusiasm in favor of hygienic science. To-day it is almost impossible to overestimate the scientific researches which have led to the antiseptic methods of counteracting the effects of microbes.

Before the light of modern hygiene the quarantine system is superseded by medical superintendence, by isolation of contagious diseases and by disinfection. Do we not see that awful disease, diphtheria, clear out of the household immediately after its first appearance before isolation and disinfection? And it is so with all other contagious diseases.

The study of bacteriology, so widely diffused at present, with a tendency to produce important results as regards both life

and health, has a right to figure in medical instruction. Hygiene should be one subject in medical education—the first, we might say, in order to make this science a reality. But we must not be alarmed at the vast extent of this science ; a matter of the greatest importance is to begin well the study of such a subject. It is of more consequence to thoroughly understand the fundamental principles and recent discoveries that may be utilized for an established purpose than to enter into the details of the science which hygiene applies.

At the International Congress of Vienna, in 1887, Dr. Smith, of London, said : " Hygiene is widely diffused in England ; but a very great number of physicians do not understand this science, and in case of infectious diseases these doctors consult specialists to learn which are the best sanitary measures to adopt in such cases." We can say to-day that in Canada quite a great number of physicians lack sufficient knowledge to make competent use of public medical practice, and to constitute themselves the valiant defenders of the lives and health of the people. To account for the reason of this deplorable state of affairs it is necessary to return to the question of medical instruction. Hygiene does not yet hold the place that it merits in medical studies. Hygiene is taught in the first years of medical study, when the student has not yet acquired that amount of knowledge necessary to understand its principles and to grasp the whole practical importance of the subject. That hygiene is the synthesis of medical science seems to be forgotten.

At the faculty of medicine in Paris the teaching of hygiene ranks after that of physics, chemistry, natural medical history, histology, physiology, general pathology, internal pathology, external pathology, practical medicine, and midwifery. This teaching is embraced in the programme of the fourth examination of medical studies. With such instruction France has reason to hope that she will have before long a phalanx of physicians well versed in the science of hygiene and in French public medical practice.

We all understand the utility of hygiene in medical education, and the necessity of teaching it in medical faculties is in conformity with the importance of this science. This reform is now very urgent in the Province of Quebec, because hygiene

has entered into the path of progress. We have now a Board of Health which manages public hygiene ; a journal of health which operates in making the science popular and thus really practical. Hygiene is also introduced in the schools, which goes to prove that this science is understood by our masters in pedagogy. The era of the Health Congress, opened at Brussels in 1851, still continues. During these last few years we have seen Congress after Congress assembled by the impetus of hygienic progress. This year, for the first time in the Province of Quebec, Montreal is the seat of a health congress. We see here united a great number of learned men from all parts of North America. This is a noble demonstration. How common are sanitary interests, how very identical are questions relating to health in every country ! Meetings of this kind popularize and develop hygienic knowledge already acquired. These assemblies bring together learned men, they establish between them fruitful and amicable bounds of co-operation, they cause the learned public to participate in a movement to which they would remain strangers were it not for these solemn occasions.

Now, what do we see at the head of these learned assemblies? The physician who utters the rallying cry, who impresses a current of most interesting ideas, here signalizing a necessary reform, there an important modification, besides pointing out a means prolific in practical results, giving everywhere and always a fresh impulse to the development and diffusion of hygiene. He fills an admirable *rôle* in the advancement of this science, and this one of his most beautiful titles of glory. In order to acquit himself nobly and liberally in his duties as pontiff of hygiene, the doctor should possess a great amount of knowledge, so that he may anticipate the questions about to be presented, consider their different features and extent, reply to them, and be able to justify the replies that he gives. For this reason it is of public interest and medical honor to establish a special course of experimental and applied hygiene in every faculty of medicine, and to have in these faculties laboratories and chairs of hygiene ; the teaching of this science during the last two years of medical study cannot be dispensed with ; the proof of sufficient knowledge in this science should be exacted in order to obtain the diploma of doctor in medicine.

It would be also desirable to introduce a complete and systematic course of hygienic instruction into the faculties of medicine, a course of which I will here submit a summary sketch :

1. Private and general hygiene (of man in general and as an individual ; of the atmosphere and respiration ; of the climate, soil, water ; of food and alimentation ; of corporal cleanliness ; of clothing ; of dwellings and their dependencies ; of labor, exercise, repose ; of inferior organisms) ; 2. Demography ; 3. Social hygiene ; 4. Infantile hygiene ; 5. Scholastic hygiene ; 6. Rural hygiene ; 7. Hygiene of cities ; 8. Industrial hygiene ; 9. Hygiene relating to soldiers and sailors ; 10. Hygiene of prisons ; 11. Hygiene of public edifices, hospitals ; 12. Burials and cemeteries ; and 13. Of virulent, miasmatic, and pestilential diseases ; etiology and prophylactics.

Of hygienic organization and the public practice of medicine in the different countries, as well from a national as international standpoint ; laws and penalties.

Here I conclude and deliver these pages to the close attention of those who govern the faculties of medicine. These men should urge the professors to duly consider the privileges and prerogatives that the physician has a right to enjoy in the grand army of hygienists.

They should understand the relation which to-day exists between all nations regarding *les infiniment petits.* Each one of us knows that microbes are man's most formidable enemies ; though conqueror of the lion and tiger, nevertheless man is vanquished by these microscopic beings. As hygiene has already signalized its omnipotence against the enemies of our health, the physician should not hesitate to be guided by the light of this science in the accomplishment of his social mission, which is one of devotedness and sacrifice, calling him to render the most eminent services to the family and to society.

Finally, give place to hygiene in medical education, this eminently social and humane science *par excellence.* Forward !

ANOTHER "FAITH-CURE" VICTIM.—The ten-year-old granddaughter of the late Congressman George W. Houck, of Ohio, died on the 18th inst. under the care of a Christian scientist and his wife. She was suffering from typhoid-fever, and received no medical or other attention save that furnished by the "faith cure."

TEMPERANCE TEACHING IN THE PUBLIC SCHOOLS.

By D. F. LINCOLN, M.D.

THE readers of THE SANITARIAN do not need to be informed that a certain public sentiment in the Northern States has been directed, of late years, to legislative enforcement of the doctrine of "scientific temperance," as it is called, in the public schools. The motives of the leaders in the movement are not here called in question. As to the wisdom of the means employed there is serious doubt, not only among scientific physiologists, but in the minds of large numbers of prominent educators, including school superintendents and principals. It is, therefore, with sincere pleasure that we notice the advanced and liberal ground that has been taken by the present Secretary of the Massachusetts Board of Education, the Hon. Frank A. Hill, in his Fifty-eighth Annual Report (January, 1895).

The position taken is indicated in the following quotation from the section on "Instruction in Temperance":

"It is the misfortune sometimes of a noble movement to be indiscreetly pushed. Such advocacy leads to reaction, and the cause suffers. In this way temperance is sometimes wounded in the house of its friends. The very commonness, too, of its presentation tends to take off the edge of that presentation, to permit the introduction of an element of cant, and to make of that which should be vital and effective something mechanical and inoperative. Thus, temperance, either in its narrower sense of abjuring that which intoxicates, or in its broader sense of high self-control and self-respect, loses something of caste where it should be one of the royal themes."

The promoters of the reform have insisted that the subject shall be taught to every scholar in the public schools during a part of each year of attendance. This demand has been largely conceded by school authorities, with the result that the subject becomes hackneyed and is taught in a perfunctory way by teachers whose chief care has been to see that as many

"facts" about alcohol and tobacco are put into the child's mind as the time allows. This is the "commonness of presentation," the "something mechanical" of which Mr. Hill complains.

The secretary adds that, as "in teaching spelling, it is not regarded as a sound principle to put bad spelling before the children to correct," so "it seems to be psychologically a bad method to make the woes of intemperance the main reliance in an endeavor to save people from them."

In extension of these remarks it may be said that temperance is a subdivision of the wider virtue, self-control, which may be *understood* from instruction, but cannot enter into the *life* of the pupil except by practice. Childhood learns by imitation, and the teacher herself is the first lesson in temperance.

The new methods, already on trial in part, are broadly based on the general principle here indicated. Suggestions are found on page 369 of the report.

Children are not all alike docile; some accept the views of their instructors (or text-books) without question, while others reflect—possibly react. If a machine morality is taught it is seen through; and indifference or an unfriendly feeling to the reform is the result. It is earnestly hoped that the rational and prudent experiment which the Board is conducting may lead to a sound practical method of instruction in temperance.

DRINKERS AND CHILDREN.—A distinguished specialist in children's diseases (quoth the *American Practitioner and News*) has carefully noted the difference between twelve families of drinkers and twelve families of temperate ones during a period of twelve years, with the result that he found that the twelve drinking families produced in those years fifty-seven children, while the temperate ones were accountable for sixty-one. Of the drinkers twenty-five children died in the first week of life, as against six on the other side. The latter deaths were from weakness, while the former were attributable to weakness, convulsive attacks, or œdema of the brain and membranes. To this cheerful record is added five who were idiots; five so stunted in growth as to be really dwarfs; five, when older, be-

came epileptics; one, a boy, had grave chorea, ending in idiocy; five more were diseased and deformed, and two of the epileptics became by inheritance drinkers. Ten, therefore, of this fifty-seven only showed during life normal disposition and development of body and mind. On the part of the temperates, as before stated, five died in the first weeks of weakness, while four in later years of childhood had curable nervous diseases. Two only showed inherited nervous defects. Thus fifty were normal, in every way sound in body and mind.

MEDICAL EXCERPT.

By T. P. Corbally, A.M., M.D.

Peptenzyme is a preparation of the digestive principles of the gastric, pancreatic, and intestinal glands, and the secretion of the liver and juice of the spleen, extracted and prepared under proper conditions, and without the aid of alkalies, acids, or chemicals. The digestive secretions are obtained in such a way as to preserve and retain all the digestive properties as they exist in nature. By overlooking the fact of the variety of digestive ferments in the alimentary tract, and by aiming simply at elegance in appearance, perfect solubility, and great strength in one direction, namely, the solution of egg albumen, chemists have supplied preparations of high dissolving power like the pepsins in the market, but which fail in practice to give results that will compare with peptenzyme. This explains the current scepticism concerning the therapeutic value of commercial pepsins as expressed by eminent clinical authorities.

Wheeler's Tissue Phosphates, a preparation by T. B. Wheeler, M.D., Montreal, commended by many physicians for their excellence as nutritive tonics in cases of malnutrition and nervous debility. F. W. Campbell, Dean of Bishop's College Medical Faculty, Montreal, says (*Canada Medical Record*): "It combines with aromatics in the form of an agreeable cordial, phosphate of lime, phosphate of iron, phosphate of soda, phosphoric acid, active principles of calisaya and

wild cherry. It is really a very elegant and beautiful preparation, and is taken with ease by the most fastidious palate. But what is more important is that it is a reliable medicine, and is useful in a large number of cases. We have employed it tolerably extensively during the past year, and have every reason to be satisfied with the results it produced; we therefore have no hesitation whatever in recommending it."

TRIONAL.—M. Gaillard stated to the Société Médicale des Hôpitaux (*La France Médicale*, March 22d) that trional, discovered by Bauman and Kost, occupies a very important place in therapeutics, especially in Germany.

"I have given," he said, "trional to forty adults suffering from insomnia, and always, except in a single case, by the mouth, in doses of one gramme, given at once. Five patients only proved refractory to the remedy. Trional must not be considered as an antiperiodic, nor an antipyretic, nor as an analgesic; it is only a hypnotic. It produces sleep without interfering with the action of any other remedies that may be employed and without serious accidents. The sleep is calm, the awakening quiet and agreeable. I have never observed any disturbance of the circulation nor of the respiration.

"Besides, there is no marked disturbance in the urine. An analysis made by M. Boymond of the urine of a patient treated for five weeks with trional led to the discovery of a body (*réducteur lévogyre*) which M. Boymond supposes to be a product of the transformation of trional.

"Finally, trional is a good hypnotic without danger, which produces sleep sooner than chloral."

M. Marie: "I am of the same opinion as M. Gaillard. I prefer trional to sulfonal; and in giving chloralose, if we wish to avoid accidents the dose should be within the limits of 10 centigrammes."

M. Rendu: "I have given it in doses of 25 centigrammes and have never seen any dangerous symptom. The conclusion was that 0 gr. 10. could not be exceeded with safety."

M. Muselier gave 20 centigrammes of chloralose to a patient sixty years of age with heart disease, to produce sleep, instead of chloral. The patient fell into a state of collapse and died."

SUBCUTANEOUS INJECTIONS IN TUBERCULOUS CHILDREN.—M. Hutinel reported to the Société Médicale des Hôpitaux (*La France Médicale*, March 22d) that :

" The recent communications of M. Variot have led me to make a brief notice of the observations I have made, extending over a period of more than two years, on the pathogenic action of certain liquids injected under the skin, particularly in children who were the subjects of tuberculosis, either active or latent.

" These researches seem to me to warrant the following conclusions :

" If the subcutaneous injections of the albuminous serum, or of saline substances in proper proportions, can occasion fever in healthy subjects, then, if used in even smaller doses, they will cause febrile reaction of unusual intensity in tuberculous individuals ;

" That these febrile movements are sometimes accompanied with hæmorrhagic tendencies in the expectorations, which are not always without danger ;

" That the intensity of these reactions may give rise to the suspicion of the existence of certain latent tuberculous conditions, without, however, constituting a pathognomonic sign of tuberculosis.

" It would not, then, be considered presumptuous to add that, in cases in which the tuberculous diathesis was known to exist, or was even suspected, the hypodermic injections of serum or of saline substances in solution, made daily as therapeutic remedies, should be made with prudence, for they are not entirely without danger."

ANTIKAMNIA AS A SEDATIVE.—In the after-treatment of a case where an operation for the relief of an impermeable occlusion of the œsophagus of five years' standing had been performed by Dr. Augustus C. Bernays (New York *Medical Journal*, March 23d, 1895), " the patient rallied fairly well after the operation, but she became greatly emaciated. Liquid food was given at short intervals and stimulants as indications demanded. In order to allay the extreme nervousness and irritability antikamnia was given, and it acted promptly and satisfactorily in every instance."

EDITOR'S TABLE.

SANITARIAN, MAY NUMBER, 1895.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

FREE ANTITOXIN.

UNDER the heading, "Is this Town Going into the Drug Business?" the *Sun* a few weeks ago published a letter signed "Medicus," which, with the omission of an irrelevant paragraph, read as follows:

"I learn from to-day's paper that the Legislature may authorize the New York Health Board to manufacture and sell 'antitoxin,' and that the Mayor has been urged by officials of the Board to indorse the measure. . . . Since when is it necessary for a health board to manufacture therapeutic agents and to sell them in competition with legitimately established business concerns? And if it is right and proper that the anti-diphtheritic serum be thus manufactured and sold on a business basis by our Health Board, why may not the scope of this department be enlarged, and the manufacture of other medicines be engaged in? Why not also bake bread, slaughter cattle, make butter, etc.? The people certainly are in need of such supplies, too, and if medicines, why not food? Good and 'health board guaranteed and made' food will prevent sickness, as 'health board serum' and other drugs will cure. Your report says that 'Commissioner Edson and Secretary Clark of the department appeared in favor of the bill, and no one in opposition.' I feel sure that if due notice of the hearing had been published, medical men and those interested in the manufacture and sale of the serum would have been there to say that the Board's competition as a purveyor of the serum is not necessary, and that reliable firms are supplying all that is needed now, and at reasonable prices. Give the

opponents a chance to be heard. But, above all, don't let a communistic measure, establishing a city department in business as competitor of citizens, pass and go into effect."

To this the New York *Medical Journal* of March 23d replied as follows:

"Dear 'Medicus,' the town is already in the drug business, and has been for years, so we fear your protest comes too late; nevertheless it is gratifying to find that at last one New York physician appreciates the situation, and your letter shows a distinct advance from the attitude which, ten or twelve years ago, the local profession presented when the Board of Health was empowered to engage in the production and sale of vaccine, to the inevitable detriment of certain physicians who, by their own exertions, had overcome a tremendous prejudice against animal vaccination, certainly without any moral support from the Board, if not against the additional impediment of secret discouragement from individual officials serving under the Board. Not only was there then no protest from the physicians of New York, but physicians even lobbied in favor of the bill, to their discredit be it said."

In pleasing contrast with the action of the New York Health Department, the Massachusetts State Board of Health announces that: In accordance with its organic purpose as defined in the statutes, having in view the "interests of health and life among the citizens of the commonwealth," and recognizing the value to the people of any agent which will measurably prevent the ravages of a disease capable of destroying more than a thousand of lives annually in Massachusetts and of causing suffering which cannot be expressed numerically, the Board has prepared a supply of antitoxin for the benefit, primarily, of such communities in this State as find it difficult or impracticable for any reason to supply themselves with the new agent from reliable sources. . . .

The Board does not propose to offer it for sale, but its gratuitous distribution will be under strict conditions, designed to prevent abuse and waste and to obtain the most beneficial fruits. Each bottle is marked with a number and the date of the preparation of its contents. No antitoxin will be issued except upon a pledge that a full statement of the observed

effects of its use will be returned to the Board at the termination of the case. . . .

A blank form for the report and a detailed statement of instructions as to methods will accompany each bottle of the antitoxin serum.

For the needs of persons living within twenty-five miles of Boston, it will be required, for the present, that personal application at the office of the Board shall be made by the attending physician in the diphtheria case, or by some person authorized by him. For the convenience of more distant parts of the State, local agencies at public hospitals or municipal health offices will probably be established by the Board in accessible centres.

The office of the Board (Room 141, State House Extension) is open each week-day, except Saturday, from nine A.M. to five P.M., and on Saturday from nine A.M. to two P.M.

SAMUEL W. ABBOTT, *Secretary.*

PURE WATER—that is, water that is absolutely pure, consisting of nothing but a condensation of two volumes of hydrogen and one of oxygen—is a chemical curiosity ; for even the purest distilled water is rarely devoid of all traces of foreign matters such as are always afloat more or less in the atmosphere and ever liable to be taken up by it. Water from the soil is still more liable to impurities of one kind or another always lodged on or in it, and filtering through it. Indeed, water, as it occurs naturally, always contains organic particles, saline matters, and certain gases in solution. And it is this natural liability and property of water to become the depository or solvent of matters afloat in the air or everywhere scattered upon the surface of or lodged in the soil, that ever renders it subject to contamination and dangerous to health.

But the danger does not consist in the presence of such particles of organic matters and gases as those afloat in the free atmosphere, or the saline substances and gases common to a clean soil. Such substances do not constitute dangerous impurities. Indeed, whether water is pure or impure is entirely relative, for, as just shown, no ordinary water is pure in a strictly chemical sense. Therefore, what the sanitarian

means by "impure water" is that which contains matters injurious to health, not such as those above referred to.

These thoughts are suggested by the excellent essays on "House Sanitation" and "Household Water Supply," on other pages of this number. They suggest that besides the various ways by which water may be injuriously polluted—by sewage water in the soil or discharged into the water ways, the effluents of factories, cemeteries, farmyards, stables, etc., cesspools, midden heaps and drains, by the droppings of birds and various forms of personal solution, the débris of vegetation and the decayed roots of plants, etc.—all such sources of pollution are, or at least should be, recognizable and avoided by all sensible people. When such sources of pollution are observed or suspected and are unavoidable, boiling or distilling should always be resorted to before use for drinking, food and dish washing or cooking. Regarding such conditions of the St. Louis well water a year ago (Vol. XXII., page 566), we took occasion to refer to "Hunting's Automatic Distiller," advertised in this number. The advertisement, however, has no relation to these remarks, but the thing itself, as a simple apparatus thoroughly adapted to domestic use. It is better than boiling, because the water is re-aerated in the process of its use. It is operated by connection with the water-supply pipe, or otherwise in houses not so connected, and by placing it upon the cooking stove. The quickly generated steam rises and is condensed by contact with a cool shield cover, from which it drips *guttatim* into a receiver, and thus becomes aerated as well as purified. The particular advantages of distilled over boiled water is, that it is devoid of the remains of the impurities, not always wholly deprived of danger even after cooking. But distilled or boiled water should always be fresh —that is, recently distilled or boiled. Kept standing under the circumstances described, it is even more liable to contamination than pure water that has not been so treated.

MORNING REPOSE, OR ROOSTERS?—A gentleman having made complaint to the Board of Health that the needful repose of his children was greatly disturbed in early morning by the crowing of roosters in near-by premises, an inspector was sent to investigate. He found two maiden ladies, on the shady side of forty, in possession of a brood of a dozen hens and

three fine gamecock roosters, housed in the yard of the premises complained of. Remarking upon the fact that the roosters disturbed the adjoining tenants by their loud crowing in the early morning hours, and that they were not necessary, one of the ladies replied that they were necessary for the production of eggs, which were a part of the household economy. When told that roosters were a superfluity so far as the production of eggs was necessary, the lady exclaimed: "I never heard such a thing before in all my life, as a hen laying eggs without the co-ordination of a rooster. Well! well! I never! What wonderful things these new-fangled microbes are, to be sure, that hens can lay eggs without a rooster! I never did take much stock in mankind; but ain't these roosters handsome? I hate to part with them, and love to see them strut about and hear them sound the note of warning every morning—something that sounds like 'Women rule here!'"—INSPECTOR.

NEGRO PROGRESS.—According to a recent summary in the New Orleans *Times-Democrat*, there are now 640,800 negroes in Virginia, but of the $2,940,185 of taxes collected by the State, only $103,565, if we omit the poll tax, which is collected because it is a prerequisite for voting, and the bulk of which is not paid by the negroes themselves, but by other persons who rule their votes, the negroes pay only $43,545 in taxes, or less than seven cents a head. They pay only $35,652 on real estate and only $56 in income tax.

If the criminal expenses of the State are apportioned according to the number of convicts of each race, the cost entailed upon the State by crimes committed by negroes is $204,018, or five times what they pay in taxes. They get for schools $309,354, or seven times what they pay in. The total expense of the negroes to the State in the way of schools, normal schools, asylums, etc., is $608,383.

They pay into the State treasury $43,545 in taxes each year, and some $60,020 is paid for them as poll taxes; but even including the latter, they do not pay one sixth of what they draw directly from the treasury, and to make good this deficit, the white people have to pay out of their own pockets. This is one of the difficulties which the South has to face, and must be taken into account in considering this section.

The Virginia negroes live almost in the shadow of the capitol. Nowhere in the South have they been granted more liberty, given more opportunities, nowhere have they received more assistance; and yet, after twenty-six years of freedom, they own only one-fortieth as much property, and pay an average of only seven cents a year in taxes. It is not an encouraging picture of negro progress.

TAX ON DOCTORS.—The North Carolina Legislature, composed in great part of members whose constituency depends upon the gratuitous service of physicians, has imposed an annual tax of $10, to be paid into the State treasury for the privilege of practising medicine! "That," remarks the *North Carolina Medical Journal*, "is the edict of the mongrel Legislature which has been in session in Raleigh, and which has attracted the attention of the whole country by the many strange things they have done. But can an evil tree bring forth good fruit? Verily, no. . . .

"When called to see the child of one of these legislators which may be sick of scarlet-fever or diphtheria, he must not refuse, though he does run the risk of conveying the contagion to his own household, and though his only reward, when the child is restored to the ungrateful parent, be, 'I'm much obliged, doctor, till you're better paid.' And we venture to say that did the medical profession adopt a rule to serve no man until his past debts were settled, there would be many of those legislators, who voted to levy this tax, who would curse the ambition and chance that carried them from their ploughs and bar-rooms and placed them in the legislative halls of the State capital. . . .

"It is a damnable outrage, worthy of the gang who perpetrated it, and we feel sure that among the first things done by the next Legislature will be the repeal of this section. In the mean time, we suggest to those doctors who may have to serve one of the Solons (?) who voted for this tax, that they increase their charges to cover the amount of tax. If the legislator be a dead-head, as he is now a dead letter, cast him off and let him go to ——? no, the county doctor."

With which sentiments THE SANITARIAN fully agrees.

YANDELL.—At the Commencement of the University of Louisville, the President, Judge Pirtle, of the Board of Trustees, conferred the degree of Doctor of Laws upon Dr. D. W. Yandell, as follows: "The Board of Trustees of this institution on the 16th inst. conferred upon the senior in years, Professor of the Medical Department, Dr. David Wendell Yandell, the eminent and honorable degree of Doctor of Laws, in recognition of his great learning, his transcendent talents, and his distinguished rank in the medical profession. Dr. Yandell has been a professor in the University of Louisville for more than thirty years, and Professor of Surgery for over twenty-five years. He was a medical director in the Confederate Army. He has been President of the American Medical Association and the American Association of Surgeons. He is a life member of the College of Physicians and Surgeons of London. A son of the university, his honors are here. By his life work he has greatly contributed to the fame of the university, whose diploma is a passport through the whole medical world. Upon the brow of this, our greatest son, the university places the crown of the highest degree within its powers."

OBITUARY.

DR. WILLIAM S. W. RUSCHENBERGER, an eminent naval surgeon and scientist, died March 24th in Philadelphia at the age of eighty-eight years. He was a graduate of the University of Pennsylvania, and served with distinction in the medical service of the U. S. Navy. In 1871 he was commissioned Medical Director on the retired list, with the relative rank of Commodore. He was an active member of the Academy of Natural Sciences, whose Vice-President and President he had successively been. He was a notable Fellow of the College of Physicians, whose Secretary and Vice-President he had been. He was also a member of the American Medical Association, of the American Philosophical Society, and of the Historical Society of Pennsylvania. He had made a considerable number of contributions to scientific literature.

MORTALITY AND MORBILITY REPORTS.

ALABAMA.—Jerome Cochrane, M.D., State Health Officer, Montgomery.

Mobile, 31,076: T. S. Scales, M.D., Health Officer, reports for the month of February a mortality of 55, of which 36 were colored, and 11 were under five years of age. The annual death-rate per 1000 was 21.12.

Zymotic diseases caused 3 deaths, and consumption, 9.

ARKANSAS.—John I. Hancock, M.D., President, Argentina; D. W. Holman, Secretary, Little Rock.

CALIFORNIA.—C. W. Nutting, M.D., President, Etna Mills; J. R. Laine, M.D., Secretary, Sacramento.

For the month of February the reports from 69 cities, towns, villages, and sanitary districts, aggregating a population of 740,073, show a mortality of 900—a death-rate of 14.52 per 1000 per annum.

There were 189 deaths from consumption, 122 from acute diseases of the lungs, 4 from diarrhœal diseases, and 61 from other diseases of the stomach and bowels, 11 from diphtheria and croup, 4 from whooping-cough, 22 from typhoid-fever, 91 from cerebro-spinal-fever, 25 from cancer, and 90 from heart disease.

Reports of prevailing diseases from 44 localities, outside of the larger towns and cities, give 193 cases of acute diseases of the lungs, 96 of diarrhœal diseases, 26 of diphtheria and croup, 59 of measles, 224 of *la grippe*, 39 of typhoid-fever, 175 of malarial fevers.

Sacramento.—Dr. T. W. Huntington has been elected President of the City Board of Health, to succeed Dr. Wiard, resigned.

COLORADO.—A. Stedman, M.D., President, Denver; Henry Sewell, M.D., Secretary, Denver.

(*Rocky Mountain News*, March 29th.)—The past winter has been marked throughout the eastern parts of the country by unusual prevalence and severity of diphtheria. Each succeed-

ing year has witnessed outbreaks of diphtheria, developing into more or less severe epidemics, in different parts of Colorado; in Denver the disease is practically always present. The reports concerning the great curative value of antitoxin which have been coming from every medical centre--and which seem confirmed by the committee appointed by the Denver Medical Society to investigate the subject—led the State Board of Health to seek means to supply the antitoxin to parts of the State where it might be needed. A specific appeal for the remedy by a physician who was struggling with an epidemic of diphtheria in a distant town led the Board to take active steps to secure a supply of antitoxin. Unfortunately, notwithstanding the hearty co-operation of the governor, the efforts of the Board to accomplish its public duty have been made futile through lack of funds.

CONNECTICUT.—Professor William H. Brewer, Ph.D., New Haven, President; Professor C. A. Lindsley, M.D., Secretary, New Haven.

The mortality report for February has been received from 165 towns in the State. There were 1357 deaths reported in the State during the month. This was 321 more than in January, and 259 more than the average number of deaths in February for the five years preceding the present. The death-rate was 19.6 for the large towns, 21.4 for the small towns, and 20.0 for the State. The deaths from zymotic diseases were 163, being 12.0 per cent of the total mortality. There were 125 deaths from consumption.

Seventeenth Annual Report of the State Board to December 1st, 1894, with the Registration Report of Vital Statistics for 1893.

That epidemic diseases have been widely diffused over the State and yet have not extensively prevailed in any locality, as shown by this report, is complimentary to the efficiency of the health service. And the general detail of the report fully justifies this inference. Of small-pox there were 12 outbreaks in as many different towns, and but 17 deaths; diphtheria in 82 towns, 396 deaths; typhoid-fever in 100 towns, 262 deaths; cerebro-spinal-fever in 71 towns, 186 deaths; scarlet-fever in 84 towns, 65 deaths; measles in 61 towns, 23 deaths.

With reference to cerebro-spinal-fever, it is remarked that there is good reason for a suspicion that the diagnosis has not always been correct, but that in many instances the so-called cerebro-spinal-fever was really typhoid-fever with prominent head symptoms.

From consumption the number of deaths was 1412; pneumonia, 1257; bronchitis, 513.

Almshouses, jails and other prisons have been the special subjects of investigation during the year, and some of them have revealed extremely revolting conditions. The revelations seem to justify the assumption of prompt abatement.

Several investigations of typhoid-fever result in showing more or less distinctly the general means of communication—polluted drinking water. A prominent exception, however, was the outbreak at Wesleyan University, by eating raw oysters that had been planted in water befouled with sewage. A pre-eminently creditable investigation of expansive usefulness.

There are, besides, several miscellaneous reports and papers of conventions, on water supplies, filtration, sewage disposal, etc., of much practical utility.

Registration Report for 1893.—Population, 797,450; births, 20,296; birth-rate per 1000, 25.4; still-births, 810, 1 to every 24 living births; marriages, 6459; divorces, 390; deaths, 14,901; death-rate per 1000, 18.6.

Comparative mortality by absolute numbers from 20 prominent causes of death: pneumonia, 1465; phthisis-pulmonalis, 1405; infantile diarrhœa, 972; heart diseases, 926; apoplexy, 672; accident and negligence, 612; old age, 561; bronchitis, 521; diphtheria and croup, 467; cancer, 405; cerebral meningitis, 389; Bright's disease, 363; typhoid-fever, 275; diarrhœa and dysentery, 248; scarlet-fever, 217; peritonitis (not puerperal), 128; tubercular meningitis, 121; suicide, 111; malarial fevers, 104; measles, 69.

DELAWARE.—E. W. Cooper, M.D., President, Camden; E. B. Frazer, Secretary, Wilmington.

New Castle County, 97,000: During the three months ending December 31st, 1894, there were 390 deaths, of which 99 were of colored people and 128 under five years of age.

The annual death-rate per 1000 was 16.0. Typhoid-fever caused 16 deaths; whooping-cough, 9; diphtheria and croup, 16; scarlatina, 2; consumption, 34.

DISTRICT OF COLUMBIA, 250,000: W. C. Woodward, M.D., Health Officer.

Mortality report for the five weeks ending March 30th, 581, of which number 255 were of colored people, and 203 were under five years of age. The annual death-rate was 23.10 per 1000. There were 67 deaths from zymotic diseases, and 71 from consumption.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M.D., Secretary, Jacksonville.

The summary, as published in *Florida Health Notes* for the month of January, is as follows:

Number of counties reporting, 45; number of cities reporting, 3; total population of said counties and cities, 391,422; number of deaths reported, 318; death-rate per 1000 per annum, 9.53; number of deaths under five years of age, 82.

GEORGIA.—

ILLINOIS.—William E. Quine, M.D., President, Chicago; J. W. Scott, Secretary, Springfield.

Chicago, 1,600,000: A. R. Reynolds, M.D., Commissioner.

Small-pox (Chicago *Times*, April 9th).—Secretary Scott, of the State Board of Health, reports 14 cases of small-pox at Shawneetown and 6 cases at Mattoon. Quarantine has been established against Shawneetown at points on the Louisville and Nashville Railroad.

INDIANA.—S. S. Boots, M.D., President, Greenfield; C. N. Metcalf, M.D., Secretary, Indianapolis.

Diphtheria at the Institute for Feeble-Minded Youth, at *Fort Wayne*, March 22d (Evansville *Courier*, March 23d): Up to this time, out of 40 cases there have been only 2 deaths from this disease—a most remarkable showing. Nearly every case yields promptly to the influence of antitoxin.

IOWA.—Frederick Becker, M.D., President, Claremont; J. F. Kennedy, M.D., Secretary, Des Moines.

From the State Board *Bulletin* for February:

Cedar Rapids, 25,000, reports for February: Deaths, 16.

Clinton, 22,000, reports for February: Deaths, 15.

Creston, 10,000, reports for February: Deaths, 13.

Davenport, 35,500, reports for February: Deaths, 28—diphtheria, 1; typhoid-fever, 1.

Des Moines, 82,000, reports for February: Deaths, 41.

Keokuk, 18,000, reports for February: Deaths, 13.

Oskaloosa, 8000, reports for February: Deaths, 10.

Dubuque, 40,000, reports for February: Deaths, 36—diphtheria, 3; pneumonia, 2; consumption, 3.

KANSAS.—T. E. Raines, M.D., President, Concordia; T. Kirkpatrick, M.D., Secretary, Westphalia.

Topeka (*Journal*, April 4th).—Governor Morrill to-day appointed three new members of the State Board of Health: Dr. C. D. Clark, of Ottawa County, who succeeds Dr. Wilson; Dr. E. M. Hoover, of Harvey, and Dr. J. P. H. Dykes, of Stafford County, to succeed Dr. Gifford.

KENTUCKY.—Joseph M. Matthews, M.D., President, Louisville; J. N. McCormack, M.D., Secretary, Bowling Green.

LOUISIANA.—S. R. Oliphant, President, New Orleans; W. R. Harnan, M.D., Secretary, New Orleans.

New Orleans, 254,000—184,500 white, 69,500 colored. There were reported for four weeks ending March 30th, 756 deaths, of which number 312 were among the colored people, and 196 of children under five years of age. Annual death-rate per 1000, 35.86. Zymotic diseases caused 92 deaths, and consumption, 76.

MAINE.—C. D. Smith, M.D., President, Portland; A. G. Young, M.D., Secretary, Augusta.

Rockport.—An outbreak of diphtheria (*Bulletin* for February reports) was due to an infected harmonica, so the Health Officer of that town appears to have reason to believe. A little girl in a family in Belfast, where one child died of diph-

theria, had a sore throat and came to Rockport then not able to speak plainly. She had a harmonica which afterward was used by two boys in two separate families. These two boys were the first to come down with the disease in Rockport, and both sickened about the same time. One died and the other recovered.

Portland, 40,000: Edwin Q. Dyer, Secretary of the Board of Health, reports for March: Deaths, 65; under five years of age, 18; annual death-rate per 1000, 21.12.

MARYLAND.—John Morris, M.D., President, Baltimore; James A. Steuart, M.D., Secretary, Baltimore.

Baltimore, 455,427: James F. McShane, M.D., Commissioner, reports for the month of February that the total deaths were 904—an increase of 221 compared with the corresponding month of February, 1894. Of these 678 were whites and 226 colored—a death-rate of 19.23 per 1000 for the former and 36.37 per thousand for the latter. The death-rate per thousand for the whole population was 21.87. Fifty-five died from infectious diseases, 101 from consumption, 166 from pneumonia, 60 from bronchitis, 42 from influenza, 3 from pleurisy, 13 from Bright's disease, 21 from nephritis, and 11 from typhoid-fever. Three hundred and six, or 33.84 per cent of the total deaths, were in children under five years of age.

During the month 154 cases of infectious diseases were reported—a decrease of 73 compared with the preceding month.

MASSACHUSETTS.—H. P. Walcott, M.D., Chairman, Cambridge; S. W. Abbott, M.D., Secretary, Boston.

Boston, 501,107: S. H. Durgin, M.D., Chairman, reports for the month of February 1028 deaths, of which 302 were under five years of age. The annual death-rate was 24.61 per 1000. From zymotic diseases, including tubercular diseases (177), there were 313 deaths, of which 65 were due to diphtheria and croup and 12 to scarlatina. Of these and other zymotic diseases the number of cases reported during the month were: Diphtheria, 294; measles, 180; scarlatina, 174; typhoid-fever, 16.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M.D., Secretary, Lansing.

Bulletin for March, 1895 : Compared with the preceding month, pneumonia and pleuritis increased in area of prevalence.

Compared with the average for corresponding months in the nine years 1886-94, influenza and scarlet-fever were more prevalent, and intermittent-fever, erysipelas, remittent-fever, and consumption were less prevalent in March, 1895.

Including reports by regular observers and others, consumption was reported present in Michigan at one hundred and forty-seven places (probably only a very small proportion of the cases of consumption are yet reported) ; scarlet-fever at seventy-four places ; diphtheria at fifty-four places ; measles at twenty-seven places ; typhoid-fever at twenty-four places, and small-pox at six places.

Reports from all sources show typhoid-fever reported at seventeen places less ; scarlet-fever at thirty-one places less ; diphtheria at thirteen places more ; measles at seven places more, and small-pox at two places less in the month of March, 1895, than in the preceding month.

Detroit.—Dr. S. P. Duffield has been reappointed Health Officer by the New Board of Health. A recent decision, on appeal against the order of the Board of Health requiring school children to be vaccinated, upholds the order.

MINNESOTA.—Franklin Staples, M.D., President, Winona ; C. N. Hewitt, M.D., Secretary, Red Wing.

Minneapolis, 223,700 : E. S. Kelley, M.D., Commissioner, reports for February 146 deaths—49 under five years of age. Death-rate per 1000, 9.41. From zymotic diseases there were 12 deaths, and from tubercular diseases, 24.

St. Paul, 155,000 : H. F. Hoyt, M.D., Commissioner, reports for February 114 deaths—41 under five years of age. Annual death-rate per 1000 was 8.75. Deaths from zymotic diseases, 14 ; and from tubercular diseases, 27. Contagious diseases reported, 22, of which 12 were of diphtheria and croup, 28 of scarlet-fever.

MISSISSIPPI.—W. F. Hyer, M.D., President, Meriden ; Wirt Johnson, M.D., Secretary, Jackson.

MISSOURI.—F. J. Lutz, M.D., President, St. Louis ; Willis P. King, M.D., Secretary, St. Louis.

St. Louis, 540,000: George Homan, M.D., Commissioner of Health.

Report for the month of February: Deaths, 787; under five years of age, 299; from zymotic diseases, 110—44 from diphtheria and croup; from phthisis and tuberculosis, 90. Annual death-rate per 1000, 17.4.

Kansas City, 124,000: R. P. Waring, M.D., Health Officer. Deaths for February, 147; under five years of age, 53. Annual death-rate per 1000 was 11.76. Contagious and infectious diseases reported for the month, 58, of which there were of diphtheria, 41.

NEBRASKA.—J. V. Beghtol, M.D., President, Friend; F. D. Haldeman, M.D., Secretary, Ord.

Omaha, 140,452: John J. Saville, M.D., Health Commissioner, reports for January: Total number of deaths, 95; under five years, 40; annual death-rate, 8.1.

Communicable diseases reported: Scarlet-fever, 87—8 deaths; diphtheria and croup, 5—1 death; typhoid-fever, 4.

NEVADA.—S. L. Lee, M.D., President, Carson City; J. A. Lewis, M.D., Secretary, Reno.

NEW HAMPSHIRE.—G. P. Conn, M.D., President, Concord; Irving A. Watson, M.D., Secretary, Concord.

NEW JERSEY.—C. F. Brackett, M.D., President, Princeton; Henry Mitchell, M.D., Secretary, Asbury Park.

Eighteenth Annual Report of the State Board for the year 1894, *and Report of the Bureau of Vital Statistics for the statistical year ending June 30th*, 1894.

The report opens with a brief sketch, and other pages an obituary by Henry R. Baldwin, M.D., of the late Secretary, Dr. Ezra M. Hunt, deceased. "Recent Sanitary Progress" and "Thoughts for Sanitary Workers," by Ezra M. Hunt, M.D., follow, and are believed to be his last contributions to sanitary science. "Garbage Cremation in Atlantic City" is an illustrated description of a process by H. S. Seull, Secretary of Atlantic City Board of Health, satisfactory to the health authorities. Following this is an account of the

typhoid-fever outbreaks in Montclair in the spring, and in Bay Head in the summer of 1884. In both instances the preponderance of evidence shows that they were due to *milk diluted with polluted water.* The "Causation of Disease by Milk" is the subject of two special essays, one by Dr. R. G. Freeman, considered from a twofold aspect: 1. Diseases originating from the cow, as tuberculosis, anthrax, foot-and-mouth disease, and acute enteritis. 2. Originating elsewhere, as cholera, typhoid-fever, scarlatina, and diphtheria—milk pollution. The other by Dr. Henry L. Coit, of the same scope, and in addition, suggests measures of prevention. Both are of much practical value and worthy of extensive circulation. There are other useful essays and discussions—the proceedings of New Jersey State Sanitary Association—on "Diphtheria," "Ventilation," "Separate System of Sewerage," "The Child of the State," "Hygienic Supervision of Schools," etc.

The "Local Boards of Health Reports" show a well-organized sanitary force, some excellent results, but a fruitful field requiring more and better-paid labor.

Vital Statistics.—Population, 1,578,373; marriages, 16,245 (non-residents, 3881); births, 33,662; deaths, 30,004; deaths under five years of age, 11,477; death-rate per 1000 population, 19.09. Prevailing causes of death: From acute lung diseases, 4183; diarrhœal diseases of children, 3893; consumption, 3433; adult brain and spinal diseases, 2413; diseases of heart and circulation, 2112; brain and nervous diseases of children, 2083; adult digestive and intestinal diseases, 1565; diphtheria and croup, 1294; cancer, 731; typhoid-fever, 485; whooping-cough, 328; puerperal diseases, 293; scarlet-fever, 272; measles, 257; remittent-fever, 162.

Hudson County, 318,746: W. W. Varick, M.D., President, reports for February 589 deaths, of which 225 were under five years of age. The annual death-rate per 1000 was 26.3. There were 68 deaths from zymotic diseases and 63 from consumption.

Paterson, 95,262: J. L. Leal, M.D., Health Officer, reports 160 deaths during February, of which 60 were under five years of age. The annual death-rate per 1000 was 20.1. There were 12 deaths from zymotic diseases and 14 from consumption.

NEW MEXICO has organized a State Board of Health as follows: Dr. W. R. Tipton, Las Vegas, President; Dr. G. S. Easterday, Albuquerque, Vice-President; Dr. J. H. Sloan, Santa Fé, Treasurer; and Dr. F. H. Atkins, Las Vegas, Secretary.

NEW YORK.—F. O. Donohue, M.D., President, Syracuse; J. S. Barnes, M.D., Secretary, Albany.

For February the State Board *Bulletin* reports there were 10,751 deaths reported during the month, which is an estimated death-rate per 1000 population annually of 21.55, the average number of deaths daily being 384; this is 30 more deaths daily than in the preceding month, and 94 more than in the month of December, the death-rates of these respective months being 20.18 and 16.60. There were about 1400 more deaths during the month than occurred in the same month in 1893 and 1894, but the mortality is the same as that of February, 1892, at which time an epidemic of *grippe* had passed its height. A large number of deaths from *grippe* have been reported, the epidemic having commenced about January 1st, but no record is kept of them, since the complete mortality properly to be credited to this cause can only be estimated by the increase in deaths reported from local diseases. There is a relative increase in deaths from acute respiratory diseases over January of 300, and over February, 1894, of 600. There is a marked increase in the reported mortality for diseases of the circulatory system; also of the urinary system; there were 100 more deaths from old age than usual at this season, and from unclassified causes, which includes many of the reports of *grippe*, the number is increased by not less than 600. At the same time the mortality for zymotic diseases is unusually low, so that it is probable that the undisturbed mortality for the month would not much have exceeded 9100; it may be estimated that influenza (*grippe*) caused 1600 deaths, or 57 per day to 45 in January, the total for the present epidemic thus far being 3000. It is probable that March will show a similar mortality from it. The mortality from common zymotic diseases continues, as in January, low, being at least 300 less than a year ago. Diphtheria has fallen 150 deaths below the low rate of January, 390 deaths from it being less than in any

February for ten years; there was a decrease of 100 deaths in the maritime districts. All the zymotic diseases have lower death-rates than a year ago, except whooping-cough, which caused 87 deaths, distributed over almost all parts of the State; and typhoid-fever, the increase from which is confined to the Hudson Valley district, there being an unseasonable prevalence of it especially in Albany. Small-pox caused 5 deaths (52 in February, 1894)—4 in New York and 1 in Brooklyn; it does not exist in the State outside the metropolis. Consumption caused 1159 deaths, which is excessive for the month, due to the *grippe* epidemic which accelerates its mortality. The prevailing direction of the wind was generally southwest, the velocity being high, the average mean temperature was 20°, or 6° below the normal, with ranges between 44° and −15°, the precipitation continues as in January, less than the average.

New York, 1,995,000: Total deaths, 3643—1302 under five years. Death-rate, 23.80. Zymotic diseases per 1000 deaths from all causes, 107.10; 117 from croup and diphtheria. Deaths from consumption, 464.

Brooklyn, 1,086,000: Total deaths, 1753—586 under five years. Death-rate, 21.00. Zymotic diseases per 1000 deaths from all causes, 96.85; 106 from croup and diphtheria. Deaths from consumption, 206.

Syracuse, 95,000: Total deaths, 143—35 under five years of age. Death-rate, 18.60. Zymotic diseases per 1000 deaths from all causes, 70.00; croup and diphtheria, 1. From consumption, 16.

Albany, 98,000: Total deaths, 236—72 under five years. Death-rate, 38.32. Zymotic diseases per 1000 deaths from all causes, 156.75; croup and diphtheria, 4. From consumption, 17. From *typhoid-fever* the number of deaths was 17, more than in any other city in the State, and, proportional to population, more than in any city of the United States reported. Health Officer Balch contends that it is not the Troy sewage which the people drink in the polluted water, but the filthy system of sewerage, lack of means to dispose of garbage, and dirty streets.

Buffalo, 300,000: Total deaths, 413—149 under five years. Death-rate, 17.00. Zymotic diseases per 1000 deaths from all

causes, 100.00; from diphtheria and croup, 15. From consumption, 41.

Rochester, 150,000: Total deaths, 224—54 under five years. Death-rate, 19.00. Zymotic diseases per 1000 deaths from all causes, 59; croup and diphtheria, 3. From consumption, 25.

NORTH CAROLINA.—H. T. Bahnson, M.D., President, Salem; Richard H. Lewis, M.D., Secretary, Raleigh.

Fifth Biennial Report of the State Board, 1893-94, a volume of 236 pages, summarizes the general progress of public interest in practical sanitation throughout the State, amendment of the health laws, organization of local boards, school hygiene, investigation of malarial diseases with relation to drinking water, water supplies, sewage disposal, disinfection, and quarantine for the restriction of contagious diseases, etc., and vital statistics. The number of towns now reporting mortality and morbility statistics is 29 as against 20 two years ago. The total population represented by these 29 towns is 144,934—85,750 white, 59,294 colored; annual death-rate per 1000 of the former, 12.4; of the latter, 21.7; deaths from consumption among the whites, 1.33 per 1000; among the colored, 3.11. The great disparity in the death-rates of the races is attributed to insufficient food and clothing, stifling and filthy quarters, the prevalence of syphilis, and needful nursing in time of sickness of the colored race.

Bulletin of the State Board of Health for February: Twenty-nine towns, aggregating 146,354 population, deaths, 163; 93 were of colored people, and 31 were of children under five years of age.

The annual death-rates were 9.8 per 1000 for the white population, 18.5 for the colored population, and 13.4 for the total. From consumption, 42.

Asheville, 12,000: Total deaths, 7; consumption, 1. Annual death-rate, 7.0 per 1000.

Charlotte, 14,000: Total deaths, 14. Annual death-rate, 11.2 per 1000.

Raleigh, 15.000: Total deaths, 22. Annual death-rate, 17.6 per 1000.

Wilmington, 22,000: Total deaths, 31. Annual death-rate, 16.9 per 1000.

NORTH DAKOTA.—Hon. W. H. Standish, President, Bismarck; F. H. DeVaux, M.D., Superintendent, Valley City.

OHIO.—Byron Stanton, M.D., President, Cincinnati; C. O. Probst, M.D., Secretary, Columbus.

Ohio State Sanitary Bulletin, Vol. I., No. 1, for March, to be published quarterly, in place of the whilom *Monthly Sanitary Record*, discontinued some time ago. It contains the full proceedings of the conference of State and local boards of health held in Columbus in January, but, excepting an account of the diphtheria epidemic at Ashtabula in December, by Dr. William T. Miller, it contains no mortality or morbility reports of any other locality. Three new cases of *small-pox* were reported to the State Board of Health Tuesday, April 9th. One is at Coal City, Hamilton County, and 2 at Wellington.

Cincinnati, 336,000: J. W. Prendergast, M.D., Health Officer, reports for February, 571 deaths, of which 145 were under five years of age. The annual death-rate per 1000 was 20.3. From zymotic diseases there were 57 deaths, and from consumption, 71.

Cleveland.—Press, April 9th, reports an outbreak of *small-pox*, the first case being of a girl employed in Muhlhauser Woollen Mill Company's mill. It is supposed that the disease was communicated to her through the rags over which she worked. Malignant diphtheria also continues to prevail.

Mansfield, 18,000: J. H. Craig, M.D., Health Officer, reports 11 deaths during February, of which 1 only was under five years of age; annual death-rate per 1000, 7.03. There was but 1 death from zymotic diseases—dysentery—and none from consumption. Five cases of scarlatina and 1 of typhoid-fever were reported.

OKLAHOMA TERRITORY.—L. L. Parker, President, Kingfisher; C. D. Arnold, M.D., Secretary, El Reno.

OREGON.—*Diphtheria* is reported (*E. Oregonian*, March 19th) prevalent at *Athena*.

Pendleton, March 18th.—C. J. Smith, M.D., City Physician

and Health Officer, considering the daily business intercourse between that city and Athena, warned all residents and property owners to give immediate attention to their premises and see that no decomposing or foul-smelling material is left thereon, and, further, to see that all water-closets and cesspools are put in good hygienic condition, that by such attention they may be able to avoid a scourge of this disease, the most dreaded and destructive to child life, as well as many other diseases that arise from such sources.

PENNSYLVANIA.—S. T. Davis, M.D., President, Lancaster; Benjamin Lee, M.D., Secretary, Philadelphia.

Small-pox.—The Secretary reports, under date of April 9th, that up to March 18th there had been reported 36 cases; since that date, 19 cases and 7 deaths. The number of cases in quarantine April 9th was 41. Pittsburg is credited with only 1 case, that of the colored convalescent now in the Municipal Hospital. Of the existing cases, 27 are in municipal hospitals and 14 in private houses.

Philadelphia, estimated to the middle of 1895, 1,163,864: M. Veale, Health Officer, reports: In the five weeks ending March 30th, deaths, 2847—770 under five years of age. Annual death-rate, 25.4 per 1000. Deaths from consumption, 291.

Water filtration (*Call*, March 27th) is at last reported as an accepted intention.

A resolution was introduced into Select Council March 26th, which was adopted, authorizing the Director of Public Works to permit private parties to erect the plant.

The filters proposed are to have a capacity of not less than 300,000 gallons per twenty-four hours, and to be erected, operated and removed under the supervision of the Director of Public Works, and only by such corporations or individuals as have had one or more city filter plants in practical use for one or more years, and of a capacity of not less than 1,000,000 gallons in each twenty-four hours.

Pittsburgh, 272,000: J. Guy McCandless, M.D., Registrar, reports for three weeks ending March 16th: Deaths, 268—92 under five years of age. Deaths from zymotic diseases, 34; from consumption, 33. Annual death-rate, 16.96.

RHODE ISLAND.—A. G. Sprague, M.D., President, River Point; Gardner T. Swarts, Secretary, Providence.

SOUTH CAROLINA.—J. R. Bratton, M.D., Chairman, Yorkville; H. D. Fraser, M.D., Secretary, Charleston.

Charleston, 65,165 white, 28,870 colored; 36,295: H. B. Horlbeck, M.D., Health Officer, reports for five weeks ending March 30th: Deaths, 180—125 colored. Under five years, 41; deaths from consumption, 22. Annual death-rate, 28.73 per 1000.

SOUTH DAKOTA.—C. B. Alford, M.D., President, Huron.

TENNESSEE.—J. D. Plunkett, M.D., President, Nashville; J. Berrien Lindsley, M.D., Secretary, Nashville.

The principal diseases, named by the State Board *Bulletin*, in the order of their greater prevalence, in the State for the month of February were lung diseases, acute, *la grippe*, measles, consumption, typhoid-fever, mumps, scarlet-fever, malarial-fever, whooping-cough, diphtheria, rheumatism, chicken-pox, and meningitis.

Nashville, 87,754: Dr. N. G. Tucker, City Health Officer, reports for the year 1894, 1521 deaths—736 white and 785 colored; 507 were under five years of age. The death-rate per 1000 for the whites was 13.48; for the colored, 23.64; of the whole, 17.33. The principal causes of death were consumption, 250; pneumonia, 102; old age, 82; heart disease, 69; death by violence, 87.

TEXAS.—R. M. Swearingen, M.D., State Health Officer, Austin.

UTAH TERRITORY.

Salt Lake City, W. T. Dalby, M.D., Health Commissioner, reports for February, 65 deaths, of which 19 were under five years of age. Annual death-rate per 1000, 11.10. From zymotic diseases there were 11 deaths, of which diphtheria caused 4; measles, 4; typhoid fever, 1. There were 5 cases of diphtheria and 7 of scarlatina reported.

VERMONT.—C. S. Caverly, M.D., President, Rutland; J. H. Hamilton, M.D., Secretary, Ritchford.

VIRGINIA.—R. W. Martin, M.D., President, Chatham; A. Irving, M.D., Secretary, Richmond.

WASHINGTON.—J. R. Hathaway, M.D., President, Everett; G. S. Armstrong, M.D., Secretary, Olympia.

WEST VIRGINIA.—W. P. Ewing, M.D., President, Charleston; N. D. Baker, Secretary, Martinsburg.

WISCONSIN.—J. W. Hancock, M.D., President, Ellsworth; U. O. B. Wingate, M.D., Secretary, Milwaukee.

Milwaukee, 275,000: W. Kempster, M.D., Commissioner, reports for February: Deaths, 347—163 under five years of age.

Cases of infectious diseases reported: Diphtheria, 26; scarlet-fever, 15; small-pox, 40; typhoid-fever, 5; admitted to City Isolation Hospital, 20.

Deaths from diphtheria and croup, 12; typhoid-fever, 2; small-pox, 8; whooping-cough, 15; consumption, 23.

PROVINCIAL BOARD OF HEALTH OF QUEBEC.—E. P. Lachapelle, M.D., President, Montreal; Elzear Pelletier, M.D., Secretary, Montreal.

Montreal.—Report of the Sanitary State and Vital Statistics for 1894. Louis Laberge, M.D., Medical Health Officer: Population, 241,748, as follows: French Roman Catholics, 141,739; other Roman Catholics, 40,701; Protestants, 59,308. Births, 10,714; deaths, 6594. The ratio of French Canadian births per 1000 of the population was 55.67; other Roman Catholics, 27.64; Protestants, 28.59. The ratio of deaths was, among the French Roman Catholics, 33.28; other Roman Catholics, 21.79; Protestants, 16.52. In the low-lying ward St. Gabriel, the death-rate was 40.02 per 1000. The deaths from infectious diseases were: typhoid-fever, 42; scarlet-fever, 497; measles, 34; diphtheria, 99. Marriages per 1000 were: French Canadians, 10.27; Protestants, 8.29.

BUENOS AYRES, 580,371 : Albert B. Martinez, Director-General of Municipal Statistics.

There were 1672 deaths reported during the month of December, of which number 1057 were under the age of five years. There were 169 deaths from epidemic diseases, and 119 from consumption. Annual death-rate per 1000, 32.7.

THE CHOLERA IN EUROPE IN 1892.

Annual Report of the Medical Officer of the Local Government Board, London, 1892–93.

The special subjects of investigation and report in this fruitful volume are :

I. Digest of the Vaccination Officers' Returns, with Regard to Children whose Births were Reported in the year 1890.

II. Cholera in Europe.

English Cholera Administration.

Proposals as to Quarantine. By Dr. Barry.

III. International Sanitary Conference at Venice.

IV. Auxiliary Scientific Investigations :

Micro-Pathology of Typhoid-fever ; Antagonisms of Microbes ; Etiology of Vaccinia and Variola. By Dr. Klein.

Micro-organisms found in the Small Intestine of Man. By Dr. Cantley.

Observation on Blood Infection. By Dr. Andrews.

Chemical Pathology of Diphtheria in Relation to the Symptoms of the Disease. By Dr. Martin.

V. Water Filtration and Cholera. By Professor Koch.

Dr. Barry's Report on the Cholera comprehends an account of the invasion and its extension from place to place in the order of the date of attack. It had three centres. The first was Paris, in April, 1892, and its extension was down the valley of the Seine toward Belgium. The second centre was Asiatic Russia, the result of an exceptional epidemic in British India during 1891, followed early in 1892 by a recrudescence along the Indo-Afghan frontier and thence through Persia into Russian Turkestan. Thence, following the new line of railway from Samarkand to Oozoun Ada on the eastern shore of the Caspian, and by sea traffic reaching Baku on the west and the mouth of the Volga on the north. By means of its

rapid extension up the Volga on the one hand, and into the Caucasus on the other hand, the disease was introduced into Europe, and before the end of the year it had already extended to all but six of the governments comprised in European Russia. The third extension westward was, so far as known, not concerned with the European invasion of 1892.

Cholera prevailed in Arabia in 1890–91, when a diffusion took place along several pilgrim routes. Early in the summer of 1892 the disease was conveyed across to the Somali coast of Africa; and later in the year it was reimported thence into Arabia. In European Russia, by the close of 1892, 231,077 attacks and 151,626 deaths had been recorded; and in the Caucasus, 134,758 attacks with 69,423 deaths. The records from Russia in Asia showed 89,199 attacks and 46,841 deaths.

In Turkey in Asia, the places most affected were Erzeroum and Trebizond.

In France, of the 48 communes provided with Seine water, 28 were invaded with cholera. Paris became affected in July, the disease assuming epidemic proportions between mid-August and October. Between March 31st and the end of 1892, M. Henri Monod reports 951 deaths in the environs of Paris, and 907 in Paris itself. From the Department of the Seine it spread first to neighboring departments and then northward, in all to 49 departments. The total cholera deaths recorded in France during 1892 were 4550.

In Belgium the first cases appear to have been related to the departments of the Seine outside of Paris, mid-April. Isolated attacks in two provinces during July, following on the return to their homes of men who had been at work in localities within the departments of France referred to. Its occurrence in Antwerp was immediately following the arrival of a ship from Havre, where the disease prevailed at the time of her departure. From Antwerp it spread into nine provinces, and by the end of the year there had been 1852 attacks and 961 deaths.

In Germany, precautions began early in July. Nevertheless, the disease broke out in Hamburg about the middle of August, and soon became widely epidemic. Between August 16th and the middle of November there had been 16,956 attacks and 8605 deaths. From Hamburg it extended to 111

places along the Elbe and 27 along the Oder. Cases followed the track of the Rhine boats, and it also travelled along the banks of the Weser, the Spree, and the Vistula. Including isolated attacks, the total cholera deaths from August 19th to November 19th were 9563.

In the United Kingdom, the first case was imported into Grangemouth on August 19th. On the 25th two emigrants, who had landed at Leith, sickened in Glasgow; and on September 15th a fourth case was brought into Grangemouth. They all reached Scotland from Hamburg. Only the first case was fatal. The disease reached England August 25th, and before the end of October 35 cases had been imported, of which 11 proved fatal. "*In no instance did the disease extend to any person other than those arriving from abroad.*"

Holland received its first cases from Altona and Hamburg in August through persons engaged in shipping. All the eleven provinces suffered more or less. There were in all, between August 26th and December 31st, 293 deaths.

In Austria-Hungary the first cases occurred in Podgorze and Krakau during the early part of September, whence is involved in some obscurity. It spread to other departments, and during the months of November and December, Galicia was severely affected as the result of recurring importation from Russia. In Buda-Pesth it also broke out early in September among persons unloading hides which had reached the city from Hamburg. It extended into 25 counties and 10 municipal towns, mostly along or near the banks of the Danube and its tributaries. In Austria to the end of the year the number of deaths was 119; and in Hungary, to December 31st, 2231 cases with 1281 deaths. In Buda-Pesth, from September 26th, 1892, to February 8th, 1893, the number of deaths was 525.

Reference is also made to the arrival of the disease at the port of New York, and the unpreparedness of the quarantine to deal with it. The results are quoted from the New Jersey State Board of Health report, as follows: "Only 10 cases of cholera were recorded to have taken place in New York during 1892, and of these, the last case occurred on September 29th. Of the 10 persons attacked, 9 died." To this, with

more exactness, may be added the official report of the Health Department, 1892 :

"The 9 deaths apparently represent 8 entirely independent sources of infection ; and in none of these instances was there any extension of the disease after the Health Department took charge of them."

This success is parallel to the incident above quoted and italicized with regard to the arrival of the disease in England. But, considering the embarrassment of Dr. Jenkins, the Health Officer of the port, caused by the unpreparedness of the quarantine and the twenty days' detention circular referred to by Dr. Barry, it would be difficult to find a parallel to Dr. Jenkins's success in holding the cholera at bay under such circumstances. In this instance, at least, quarantine was a triumphant success, notwithstanding its embarrassment.

English Cholera Administration.—On July 25th a rapid medical survey of her ports was commenced, and was carried on through the three following months. More than 100 districts, including all Port Sanitary Districts, were inspected, and the authorities admonished to adopt special precautionary measures. Orders prohibiting the landing over side, in ports of this country, of certain classes of rags, bedding, etc., were issued. Old orders were amended and new ones added against the landing of passengers from infected vessels or from filthy or otherwise unwholesome vessels ; prohibiting vessels from cholera-infected places to enter any dock or basin until cleansed, properly supplied with pure water for drinking and cooking purposes, etc.—in short, requiring all the essential features of an effective quarantine, even to detention, for the required treatment could scarcely be effected within a shorter period than five days. Indeed, English port sanitation differs in nothing from American except in name, due to the characteristic perversity of Anglo-Americans to follow even bad English precedents long after the English have discarded them.

Dr. Barry's report is remarkable for its elaboration and distinctness, with maps showing the distribution of cholera in the several countries, attacks and deaths in all the localities of its prevalence, and descriptive text of data and movement.

THE NEW YORK QUARANTINE.—Report of William T.

Jenkins, M.D., for the Year 1893.—A review of this has been delayed for two months since it was received, with the hope of receiving the report for 1894, with a fuller description of the recent improvements in the establishment.

With the assistance of watchful representatives abroad, accomplished boarding inspectors of all vessels on arrival, and material improvements in the local facilities, Dr. Jenkins seems to have been well prepared for the arrival of the first and only cholera ship during the year—the *Karamania*, August 3d. She was found to have left Venice June 26th; Trieste, June 28th; Fiume, June 30th; Barletto, July 2d; Catani, July 4th; Leghorn, July 8th; Sorrento, July 13th; Naples, July 15th, and Gibraltar, July 20th, with a crew of 44, and 474 passengers in the steerage. One death had occurred on board two days after leaving Naples, attributed to congestion of the lungs. "Between the date of death of this passenger and the time of arrival at this port there were 19 cases of diarrhœa, 16 of which recovered. Of these 19 cases, none of the 16 which were reported as recovered were isolated in the hospital, and but few received any treatment except mild astringent preparations. Three died at sea, and another was sick on arrival, but not isolated. This clearly demonstrates that in times of epidemic a large percentage of cases are cholerine, which go on to recovery without serious inconvenience to the patient or without much interference with his ordinary vocation. It may be said that these cases are the most dangerous to the community, for a case which requires medical treatment is naturally brought under sanitary control, therefore is least to be feared; but if these mild cases were under medical care, at least 75 per cent of them would be saved."

A passenger taken with diarrhœa August 1st died the following day—the day before arrival here. On these facts in detail the ship was detained.

"On the following day a passenger was found so weak that he could not pass inspection. He was promptly removed to the hospital on the spar deck, where he was isolated from his fellow-passengers. This passenger confessed, when questioned, that for at least three days he had been suffering from what he considered a mild diarrhœa.

" Dr. J. M. Byron, who performed such efficient service at Swinburne Island during the visitation of cholera in 1892, was called upon to investigate bacteriologically this new invasion of the dreaded disease which again had entered the threshold of our port only to be met with the energetic management bought by our trying experience of the previous year. The evening of September 6th the following report from him was received :

" *William T. Jenkins, Health Officer, Port of New York :*

" DEAR SIR : The dejecta of Lorenzo Moracio, a steerage passenger, taken ill on board of the steamship *Karamania*, which you requested me to examine bacteriologically in view of determining the nature of the disease, has yielded pure cultures of spirillum cholera Asiatic. I, therefore, consider Moracio suffering from Asiatic cholera. I herewith inclose prepared specimens of both the dejecta and the bacilli isolated by culture.

" Respectfully,

" J. M. BYRON, M.D."

As soon as practicable after this report, August 6th, the passengers were removed to Hoffmann Island for observation. (At the time of arrival a large force of mechanics was employed on Hoffman Island making improvements.)

" They were inspected three times daily, just before being served with their meals, and required to perform their ablutions before such service. Each person, upon reporting, or discovered on inspection to be ill, was taken apart and transferred to hospital without further opportunity to mingle with his or her fellow-passengers. The children were supplied with sterilized milk, large quantities of which were obtained daily for their benefit.

" It was found that new cases continued to develop from time to time, which could only be explained by the fact that those who had mild cases of cholerine were not reporting, or could not be discovered, but were disguising their illness, and that they were encouraged and protected in this secretion by their friends. I thereupon made the announcement to them, through their interpreter, that the discovery of each case prolonged the period of detention, as well as endangered their lives and the lives of their friends, and that the prompt reporting of illness either by the patient or his fellow-passengers would, in all probability, check the disease and lessen the detention. . . . Supervision was had over the closets by the attendants, who were provided with register punches to tally all visitation of passengers, each of whom was provided with

a card ; at each inspection of the passengers these cards were taken up and new ones issued. The appearance of the card would give evidence of the frequent visits of the holder, and caused his or her immediate isolation in the emergency hospital.

" Between the arrival of the steamer at this port and the discharge of the passengers from their place of detention there were 21 developed cases of cholera ; of these 3 died. . . . There were 2 other deaths among the passengers while under detention in quarantine, 1 from natural causes—this patient had not had cholera ; the other, a convalescent from cholera, from pneumonia."

Bulletins were issued to the press daily. The ship was released August 14th. It hardly seems necessary to add that she had been thoroughly cleansed. The passengers were discharged from Hoffman Island August 18th, *five* days subsequent to the development of the last case of cholera from among them, after a final bath, and after their personal effects had again been passed through the steam disinfecting apparatus.

" At Swinburne Island, every individual, upon arrival, received a warm bath and was put to bed ; and all clothing was sent to the disinfecting-room. Fæces were then collected for examination. Those who were ill were separated from the suspects and subjected to immediate treatment Suspects were allowed to rise next day and keep out-doors in the space allotted to them. The wards were washed twice a day with the standard bichloride solution."

October 8th the *Russia* arrived, and was found to have suspicious cases and deaths. She sailed from Hamburg September 24th with 12 first and 29 second cabin and 407 steerage passengers, and a crew of 80. On arrival, one patient that had been ill several days was sent to Swinburne Island Hospital. Bacteriological examination showed that he had cholera. All the steerage passengers were transferred to Hoffman Island, where they were subjected to close vigilance, thorough cleanliness by bathing, and their personal effects subjected to steam. The cabin passengers were not removed, but were permitted to go up in the ship on the fifth day of detention.

" This stands in remarkable contrast with the history of the *Karamania ;* the *Russia* was a vessel built for the passenger-carrying trade ; not a secondary case appeared among the pas-

sengers. The non-appearance of the disease among the first and second-cabin passengers is another verification of the theory we have always advanced, that it is unnecessary to detain the passengers of a better class because cholera exists among the steerage passengers; they have not been known to introduce the disease."

This "quarantine" will certainly compare favorably with that of England in everything but the name.

Small-pox was brought into port by 10 vessels, in all 13 cases, on board which vessels there were 12,517 persons more or less liable to exposure, but there was no detention except of those who had been constant companions of those affected within fourteen days of the attack. Vaccination had been required before embarkation.

Yellow-fever was brought into port by four vessels during the year, and it had occurred on board of a number of other vessels that arrived either during the voyage or at the infected port of departure.

In order to show the prominence of the port of New York, not only over any other port of the United States, but over all the ports of the country, in the number of persons and vessels inspected at its quarantine, the following table is appended, which gives the comparative number of arrivals of vessels and passengers from foreign ports at the quarantines of four of the principal ports of the Atlantic seaboard for the year 1893:

Ports.	Number of vessels.	Number of passengers.
New York	5,060	520,840
Philadelphia	1,643	32,166
Boston	741	31,656
Baltimore	630	22,006

The number of vessels from foreign ports inspected during the year was 5060. The number of vessels from domestic ports south of Cape Henlopen, inspected during the quarantine season, was 2284.

The number of persons composing the crews of these vessels was 168,697.

The number of immigrants was 364,700.

The number of cabin passengers was 156,140.

CANADIAN QUARANTINE.—Annual Report of F. Montizambert, M.D., F.R.C.S., D.C.L., General Superintendent, to October 31st, 1894.—An admirable sketch of the prevalence of quarantinable diseases abroad during the year, and a presentation of the thoroughly equipped Canadian system to meet any contingency; but fortunately none occurred out of the ordinary course, as follows, with pertinent remark:

"The system of medical inspection of incoming vessels, with isolation and disinfection when disease has occurred, has in your quarantine regulations been made general for all Canadian ports, and brought fully up to modern scientific conclusions. In England the last trace of their 'quarantine' vote has this year been abandoned. It has lately only applied to plague and yellow-fever, the obsolete time detention having been entirely replaced by port medical inspection. It seems almost a pity to retain even the word 'quarantine.' It is founded on an idea which science has outgrown. Its retention has caused modern methods to inherit undeservedly the objections urged rightly against the old. The key of the old system was prolonged detention. That of the modern system is prompt disinfection. This, however, is becoming so generally known that the retention of the old name as a matter of convenience is yearly becoming less and less liable to lead to misunderstanding."

LODGINGS FOR SEAMEN ON SHIPBOARD.—With a view to the promotion of the health of seamen and their protection against the cupidity of owners, a new law was passed at the last session of Congress, the text of which we give below. It will be seen that the cabins must be large enough to give every man a deck space of 12 superficial feet and a total of 72 cubic feet. This is equal to a space of 2 feet wide, 6 feet long, and 6 feet high.

The act was approved March 2d, 1895, and is entitled "An act to provide for deductions from the gross tonnage of vessels of the United States." The act will take effect April 1st, 1895.

"Every place appropriated to the crew of the vessel shall have a space of not less than 72 cubic feet and 12 superficial feet, measured on the deck [illegible] of that place, for each seaman or apprentice lo[illegible]uch place shall be securely constructed, [illegible]ned [illegible]tilated, prop-

erly protected from weather and sea, and as far as practicable properly shut off and protected from the effluvium of cargo or bilge water; and failure to comply with this provision shall subject the owner to a penalty of $500. Every place so occupied shall be kept free from goods or stores of any kind not being the personal property of the crew in use during the voyage; and if any such place is not so kept free, the master shall forfeit and pay to each seaman or apprentice lodged in that place the sum of 50 cents a day for each day during which any goods or stores as aforesaid are kept or stored in the place after complaint has been made to him by any two or more of the seamen so lodged. No deduction from tonnage as foresaid shall be made unless there is permanently cut in a beam and over the doorway of every such place the number of men it is allowed to accommodate, with these words, 'Certified to accommodate . . . seamen.'

"That the provisions of this act apply only to vessels the construction of which shall be begun after June 30th, 1895."

BERMUDA.—A new health act, passed by the Bermudian Parliament last autumn, went into effect the first of the year. The Health Board consists of five members, and in having one a physician—Dr. Wilkinson—is a decided advance on the former Board, which was made up entirely of non-medical men. The Governor has appointed Dr. Harvey to be Health Officer. Under the act he cannot engage in general practice, but may serve as consultant. What with his new duties, those of Insane Asylum Superintendent and his care of the Cottage Hospital, he is not likely to find himself much of a Micawber.

"Sunnylands," the "flowery kingdom" of Dr. Outerbridge, is a picture, a thing of beauty, a floral symposium in red and white. Chinese lilies abound, and their balmy odor scents the air. It is one of the show places of Bermuda. Nowhere else is there now such a wealth of flowers, and to the sights that charm, the courteous welcome of its owner makes an added pleasure. No outing in Bermuda is complete without a call at Sunnylands.—J. B. MATTISON, M.D., *in Times and Register, April 6th*, 1895.

NEW BOOKS AND BOOK REVIEWS.

ANY BOOK reviewed or advertised in THE SANITARIAN costing $1.50 or less will be sent *free* to any present subscriber sending the name of a new subscriber, or to any new subscriber on receipt of the full subscription price sent on his own account; or any book so reviewed or advertised costing more than $1.50 will be sent at a discount of that amount.

A TREATISE ON HYGIENE AND PUBLIC HEALTH. Edited by THOMAS STEVENSON, M.D., F.R.C.P., Lecturer on Chemistry and Medical Jurisprudence at Guy's Hospital, and Official Analyst to the Home Office; and SHIRLEY F. MURPHY, Medical Officer of Health of the Administrative County of London; President of the Epidemiological Society; late President of the Incorporated Society of the Medical Officers of Health. Vol. III., SANITARY LAW. 8vo, pp. 460. Price, $6. Philadelphia: P. Blakiston, Son & Company.

This, the concluding volume of the most complete treatise on hygiene and public health hitherto published, should be particularly welcome to all sanitary organizations and officers interested in such laws, ordinances, and regulations as have been found to be most efficacious in the prosecution of sanitary work under the foremost sanitarians. It should not be inferred from the special title that this volume is intended for lawyers. On the contrary, it is for the use of non-legal readers, and includes everything that the sanitary officer requires beyond such local legislation and regulations as are clearly deducible from its thoroughly basic character.

It is divided into three parts: the law relating to the public health in England and Wales; the law relating to the public health in Ireland; and the law relating to the public health in Scotland. So much of all these is given as will admit of practical deductions and application to any community.

The great strength and adaptability of the sanitary laws of England lie in the fact that they have for the most part been inspired by, and designed to meet, practical needs; and in so far as England has taken the lead of all other nations in sanitary measures, her needs during the while have been to cope

with every conceivable condition dangerous to or in conflict with the public health. Hence her sanitary laws, as they at present obtain, have been proportionally strengthened by the test of practical experience, and show better results than those of any other nation.

This, the third volume, which completes the great work of the accomplished editors, is unlike its predecessors, in that it omits the names of the authors of the articles, for the reason (prefatorily given) that "each of them is officially engaged in the administration of the law in that part of the United Kingdom with which his article relates." Nevertheless, it shows the same degree of excellence as the preceding volumes; well written, well arranged, and well indexed, has marginal headings, cross references and side lights, greatly facilitating its utility; and gotten up in the excellent style common to the publishers.

THE INTERNATIONAL MEDICAL ANNUAL AND PRACTICAL INDEX. *Thirteenth Year*, 1895. Pp. 648, price, $2.75. New York: E. B. Treat.

This well-nigh indispensable annual to many physicians who have not had the time or opportunity to glean the immense field of current medical literature—and those who have not had time for anything else—is fully up to the excellent standard of previous volumes of the series. The corps of editors and contributors consists of thirty-seven, well chosen for their accomplishments in their respective spheres, and several of them of recognized eminence. It begins with "The Dictionary of New Remedies and Review of Therapeutic Progress for 1894," giving the gist of a year's progress, remarkable for its fruitfulness in this division; and this is followed by the closely allied subject of "New Treatment in Medicine and Surgery," abundantly suggestive of the great mass of literature that has of necessity been culled, that the gist of it all should be so presented as it here is, as to bring it within easy grasp, though taking up nearly three quarters of the volume. Next follows "Sanitary Science," discusssing in particular *sewer air*, as to whether it is innocuous or otherwise, without any satisfactory conclusion, though a rather preponderating evidence—by experiments on animals—of its danger under given circumstances,

and the utility of interceptor traps, several of which are described and illustrated. A new steam disinfector, brought out by Mr. A. B. Reck, of Denmark, is depicted and described, which appears to possess some special advantages in both efficiency and cost. The chamber is unjacketed, and the steam, entering at the top, drives the air out by a pipe at the bottom ; and when this is effected, the exit pipe is closed and the steam is driven into the chamber until the pressure rises to sixteen pounds to the square inch, and is maintained by an automatic arrangement for thirty minutes—deemed to be sufficient. Short chapters on "Progress in Pharmacy" and "New Instruments" follow, and conclude the volume.

SUGGESTIVE THERAPEUTICS IN PSYCHOPATHIA SEXUALIS ; WITH ESPECIAL REFERENCE TO CONTRARY SEXUAL INSTINCT. By DR. A. VON-SCHRENCK-NOTZING (Munich, Germany). Authorized translation from the German by CHARLES GILBERT CHADDOCK, M.D., Professor of Diseases of the Nervous System, Marion-Sims College of Medicine, St. Louis ; member of the American Medico-Psychological Association ; Attending Neurologist to the Rebekah Hospital, St. Louis, Mo., etc. One volume, royal octavo, pp. 325. Extra cloth, $2.50 net ; sheep, $3.50 net. Sold only by subscription to the medical profession exclusively. Philadelphia : The F. A. Davis Company, publishers, 1914 and 1916 Cherry Street.

This book treats of the most loathsome of abnormalities, for the most part coexistent with unfortunate environment. But a little taint is sufficient to become diffused in many directions, and there are but few physicians of much practical observation that have not encountered it, in one form or another, though unfortunately too apt to curb their knowledge. Yet the principal agency for the correction of this disease is *early* medical treatment. The lawyer may and should be in possession of the facts in the case ; the clergyman should be in a position to use his influence in the suggestive treatment ; but the physician stands where he is most likely to recognize the condition, and to him largely we must look for its alleviation. The true physician is always more or less a psychiatrist, treating the mind in connection with the body.

CONTEMPORARY LITERATURE.

SCIENCE IN THE SAME BOAT WITH THEOLOGY.—Mr. Spencer himself insists that ultimate scientific ideas are inconsistent and incomprehensible. Space, time, matter, motion, force, and so forth, are each in turn shown to involve contradictions which it is beyond our power to solve and obscurities which it is beyond our power to penetrate. Thus science and theology are, so far, on an equality, that every proposition which considerations like these oblige us to assert about the one, binds us also to assert about the other.

What reason is there for the intolerant and supercilious bigotry with which agnostics and scientists look upon the theologian? If the ultimate ideas of science are unintelligible, how can science itself be regarded as rationally established upon such an unthinkable basis? If Mr. Spencer can see that what we are conscious of as properties of matter are but subjective forces induced by objective agencies which are unknown and unknowable, what can be said as to the scientific certitude with which we make even such an assertion as that the sun gives light?—*From "The Foundations of Belief," by* W. T. STEAD, *in the April Review of Reviews.*

THE "MISSING LINK" AGAIN RELEGATED TO THE FUTURE.—In a letter to *Science*, under date of February 14th, Harrison Allen ventures to doubt the validity of the "Pithecanthropus," the skeletal fragments of which were recently found in the early pleistocene strata of Java by Dr. Dubois. The skull of the "ape man" was acknowledged by Dr. Brinton, the reviewer of Dr. Dubois' memoir, to be like that of the famous Neanderthal man, and the femora were described as "singularly human." Now on the evidence of the single [illegible]th which has been preserved, and which, Allen [illegible]ns closely to the human type, he concludes that [illegible]as in all probability a man, and not an ape [illegible]rd. Allen is supported in this opinion [illegible]h appeared in *Nature*, January 29th, [illegible]deker, who comes to the same [illegible]hed by the skull, the femora [illegible]g link" must probably [illegible] ing and ..

join its discredited predecessors, and the "ape man," if found at all, must be dug up from strata earlier than those of the early pleistocene of Java.

THE DUTY EVERY CITIZEN OWES THE SCHOOLS.—If the public school, in those sections of our cities where our most intelligent and influential citizens have their homes, are unsatisfactory, they could speedily be made as good as any private school, where the same interest manifested by the taxpayers as is shown when an undesirable pavement is laid, or a company threatens to provide rapid transit before their doors. Unfortunately, that same spirit of aloofness which has in the past operated largely to exclude this element in the nation from participation in the affairs of popular government, seems to be at the bottom of this matter. Certainly much progress has been made in the last twenty years in remedying the political evil, and the public good appears to demand a change of front from the same class of people on the subject of common education, unless we are prepared to advocate the existence and growth of a favored special class, out of touch with and at heart disdainful of the average citizen.—*From "Education —The Art of Living," by* ROBERT GRANT, *in the April Scribner.*

PENALTIES OF IGNORANCE.—Since Pasteur in the course of his chemical researches dragged the long-hidden cause of disease into light, and opened our eyes to a hitherto unsuspected law of nature, we can no more get rid of the newly revealed facts than we can stop the rotation of the earth. And yet this knowledge, so important in housekeeping, so useful to those who are responsible for the health of others, and which so closely concerns us all, forms no part in the general education of the people. The precious key has been given to us, but, so far as domestic life is concerned, the gates of knowledge remain closed. Now, if the poor man understood the *raison d'être* of the antiseptic dressing of his wounds, and the rich man knew the beautiful part Nature takes in providing him with the clear and sparkling ale and wine on his table, then would they severally know that the matter of life or death, success or failure in many things depends on our realizati-

that world of busy living organisms which we cannot see. But, as things are at present, we accept our blessings as we accept our pains and penalties, in profound ignorance of why and whence they come; and until we fully recognize this "third realm" and understand its direct and indirect influence on our health and the healthiness of the perishable things round about us, we are bound to suffer the consequences of ignorance and waste.—LADY PRIESTLEY, *from "Penalties of Ignorance," Nineteenth Century for April.*

MENTAL POWER FROM MANUAL TRAINING.—Power, that is what we are after. Let us keep it always in mind. Let us not be turned off from the main quest, however alluring the side issues. We want the increased power of the human spirit.

Now, power is a result as well as a cause. Intellectual power is the result of a developed brain organism. This development comes through use. Any activity at the circumference means a corresponding activity at the centre. The exercise of any one of the senses means the development of its corresponding brain centre. The sum of this development is intelligence. This is what I mean by the psychological import of manual training. This it is which makes the lovers of power value manual training. Each movement of a motor nerve, whether it be in the fashioning of wood or metal or clay, involves a corresponding brain movement. These movements stimulate growth, and growth is what we are after. Intellect is a function of brain surface.

I believe, then, that the very strongest argument for manual training is not the practical value of the skill which it develops, not even the moral significance of the sturdiness which it inculcates, but that it is something which includes these and the other ends of culture, that it is the increased intellectual power which is the necessary physiological result of such training. This is a large claim, and one that has never been urged before, I believe, on precisely these grounds. But it is a claim which can be fully substantiated.—DR. C. H. HENDERSON, *in the Popular Science Monthly for April.*

TESLA'S NEW ELECTRICAL POSSIBILITIES.—After describing and illustrating in his article on Nikola Tesla's work, in

the April *Century*, the process and apparatus employed for manipulating the electrical charge of the earth itself, Mr. T. C. Martin makes this comment on the unique phenomenon presented. Considering that in the adjustments necessary, a small length of wire or a small body of any kind added to the coil or brought into its vicinity may destroy entirely all effect, one can imagine the pleasure which the investigator feels when thus rewarded by unique phenomena. After searching with patient toil for two or three years after a result calculated in advance, Mr. Tesla is compensated by being able to witness a most magnificent display of fiery streams and lightning discharges breaking out from the tip of the wire with the roar of a gas-well. Aside from their deep scientific import and their wondrous fascination as a spectacle, such effects point to many new realizations making for the higher welfare of the human race. The transmission of power and intelligence is but one thing; the modification of climatic conditions may be another. Perchance we shall "call up" Mars in this way some day, the electrical charge of both planets being utilized in signals.

A CONGESTED DISTRICT.—Three types at least are observable in the south of Ireland: first the dark, Italian-looking Celt, also found in Devon; secondly, the tall, yellow-haired Danish type; and thirdly, the aboriginal Aryan of the Volga, with red or auburn hair and blue or green eyes, who may also be found in Cornwall. The dark, aquiline type of Wales differs considerably from that of the Irish; and the Irish language is nearer akin to Cornish than to Welsh. The traditional Irishman of caricatures is not often seen in the south, though this type is not unknown even among the upper classes. The soft features and bright eyes of the modest peasant women present many varieties of beauty; and the mingled race of Cork and Kerry—fairer as a rule than that of the far west—is as vigorous as any in Scotland or in Yorkshire.—*Littell's Living Age, No.* 2646.

TRAMP LIFE.—To get at the secret of the tramp—to find out why he enjoys being a vagabond—is to solve the problem he presents. Josiah Flynt, in an article on "Club Life among

Outcasts," in the April *Harper's*, gives an insight into the social side of tramp life, and makes clear its attractiveness to the unbalanced mind of the "hobo." The tramp likes to be a tramp, not only because he is irresponsible, but because good-fellowship is the rule among outcasts. To eradicate the pest of tramps, the "gang" and the "hang-out," which are the tramp's equivalent for club and club-house, must be broken up, and the freemasonry of hobo-land thereby destroyed.

THE NORTH AMERICAN REVIEW for April contains a second paper by DR. CYRUS EDSON, on "Nagging Women." He pays his respects in few words to Lady Henry Somerset, Mrs. Harriet Prescott Spofford, and Marion Harland, who, in the March number, criticised his opinion of "Nagging Women," which, it will be recalled, was a popular feature of the January number.

A valuable contribution to naval literature is contained in the paper by Admiral P. H. Colomb, of the Royal Navy, on "The Future of the Torpedo in War." Admiral Colomb graphically predicts the use of that enormous engine of destruction in future naval combats.

Dr. Paul Gibier, director of the Pasteur Institute, New York City, writes on "The Physician and the Social Question."

The fourth instalment of the "Personal History of the Second Empire," by Albert D. Vandam, author of "An Englishman in Paris," also appears in this number, and it is believed that the readers of the *Review* will find this remarkable serial increasing in interest as it progresses.

THE BUFFALO MEDICAL AND SURGICAL JOURNAL signalizes its semi-centennial anniversary by a process which is alike gratifying to its readers and encouraging to its contemporaries by increasing its reading pages from sixty-four to eighty, and by making other improvements that will contribute to its efficiency and keep it abreast of the professional progress of the period—a mark of merited success on which THE SANITARIAN offers hearty congratulations.

ANNOUNCEMENTS.

THE AMERICAN MEDICAL ASSOCIATION.—The forty-sixth annual session will be held in Baltimore, Md., May 7th–10th, commencing on Tuesday, the 7th, at ten A.M.

AMERICAN MEDICAL PUBLISHERS' ASSOCIATION will meet at the Eutaw House, Baltimore, Md., May 6th, at 9.30 A.M. Subjects of vital importance will be discussed, and a profitable and pleasant session is anticipated. President, Landon B. Edwards, M.D., Richmond, Va.; Secretary, Charles Wood Fassett, St. Joseph, Mo.

ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES will hold its fifth annual meeting at Buffalo, N. Y., May 21st–23d, 1895. President, George M. Sternberg, Brigadier-General and Surgeon-General U. S. Army, Washington, D. C.; Secretary, Eustathius Chancellor, Lieutenant-Colonel and Medical Director National Guard of Missouri, 515 Olive Street, St. Louis, Mo.

MEDICO-LEGAL CONGRESS—SUMMER VACATION OF 1895.—The Medico-Legal Society announces that it will hold a Medico-Legal Congress at or near the city of New York during the last week of August or first week of September, 1895 (time and place to be hereafter announced), open to all students of medical jurisprudence, under the charge of a committee of arrangements composed as follows: Ex-Surrogate Rastus S. Ransom, Chairman; Clark Bell, Esq., Secretary; George Chaffee, M.D., Treasurer; Moritz Ellinger, Esq.; H. W. Mitchell, M.D.; Constantine J. MacGuire, M.D.; Professor A. M. Phelps, M.D.

An enrolling fee of $3 will be required of each member to aid in the expenses and the publication of the *Bulletin* of the Congress, to be sent each member free.

CLARK BELL, Esq., *Secretary*,
57 Broadway, New York.

THE SANITARIAN.

JUNE, 1895.

NUMBER 307.

THE WORK OF THE SANITARY ENGINEER IN TIME OF EPIDEMICS, IN TIME OF WAR, AND IN SUDDEN CALAMITIES IN CIVIC LIFE.

By WILLIAM PAUL GERHARD, C.E., Consulting Engineer for Sanitary Works.

IN the present age of keen business competition, and in the stern realism of modern life, one is far too apt, in choosing or in pursuing a profession, to consider purely the business aspect involved, or, in other words, the expected financial gain, and one generally forgets the humanitarian side incident to every professional man's career. In the every-day life of a nation, of a State, or a community contingencies are likely to arise at any time which require the exercise of the faculties acquired in the pursuit of a business, trade, or profession in order to apply them—at such times—in the interests of humanity. Among such contingencies are outbreaks of epidemics, war, and great disasters in civic life.

I propose in the following to discuss briefly what services and aid the professional man, who has chosen "sanitary engineering" for his calling, can render in such extraordinary events to the cause of humanity.

I. *Work of the Sanitary Engineer in Case of Sudden Outbreaks of Epidemics.*

"Mankind is accustomed to the ceaseless and regular work of death, to the slow removal of human beings from its midst. One may compare it," says a German writer, "to the leaves of a tree, which, after changing color in autumn, drop off one by one as the winter comes. So also, one by one, will men sink into their graves, while new generations arise, only to meet the same fate in the end. This is the inevitable decree of destiny, of the order of things in nature. But the aspect

of death changes when an epidemic breaks out. It is then more like the sudden uprising and uproar of a storm, which in its mad fury breaks off delicate branches and twigs and uproots strong and healthy trees. It is death, again, to be sure, which we see all around us when an epidemic rages, but death in a different form, clad in a strange and dismal raiment, which shakes the nerves of the strongest and bravest men." At such times the people begin to feel that perhaps the wholesale dying need not have taken place, that the causes which led to the calamity might have been avoided—in short, that death in epidemics, far from being a dispensation of Providence, is the result of man's own carelessness or neglect or indifference in sanitary matters.

When an epidemic threatens, the work of the sanitary and municipal engineer consists principally and first of all in measures of prevention. He should pay particular attention and care to all hygienic municipal work, such as the public water supply, the sewerage, the scavenging and street cleaning, the sewage and garbage disposal, the public bath and wash-houses, market-houses, abattoirs, and public water-closet conveniences. Increased cleanliness is required for all public conveyances, hacks, cabs, street-cars, elevated and steam railroads, as well as ferry-boats, and stricter attention should be paid to railroad depots, stables, to hotels, and to public lodging-houses. It is well, at such times, to institute a sanitary survey of the city, including a house-to-house inspection, with particular regard to the tenement districts. Hospitals for the reception and care of infected patients should be planned, located, and arranged. Speaking broadly, the problems which in such a case arise for the sanitary or municipal engineer consist in stricter and closer attention to the sanitation of the soil, the air, the water, the food supply, and the dwellings of a city.

In case the epidemic actually breaks out, the extraordinary duties of the sanitary engineer embrace mainly the following work—viz.:

1. Measures for the protection of those who are not sick.
2. Measures for the proper care of the sick.
3. Measures for prompt and safe removal and disposal of the dead.

While some of the work to be performed is of a medical nature, not a little of it, particularly as regards preventive measures, belongs to the province of the engineer. Both the physician and the sanitary engineer should therefore work hand in hand, and assist and supplement each other. Physicians, however, are rarely sufficiently educated in technical details of sanitation, and it seems at least doubtful, if it would not be a serious mistake, to put all the preventive measures in the exclusive charge of health officers. A division of the work would be, to my mind, far preferable, and would offer considerable practical advantages.

Among measures for the protection of those who are well, the preservation of the purity of the drinking water is of great importance. Regular periodical chemical and bacteriological examinations of the water supplied by the city water-works should be instituted. The sanitary engineer must have a sufficient knowledge of the noxious components of water, and of the methods of detecting these impurities or contaminations, in order to be able, if not to perform the analyses himself, at least to interpret the results of the chemist's and microscopist's work correctly. In addition to this, it is essential that all public wells in streets or squares, as well as those in private grounds, be watched with care. It is advisable to close up at once all suspicious wells. Likewise should all rain-water cisterns be cleaned and purified, and where filters are used, the filtering material should be sterilized or renewed. It is better, however, to avoid entirely during epidemics the use of filters, and to make it a practice to boil all water used for drinking purposes. Finally, the ice supply should be watched, the sale of all impure ice or ice cut from contaminated ponds prohibited, and the householder cautioned to use the ice which is intended for the cooling of beverages in vessels with separate compartments, so that the melted ice cannot mix with the water.

The sanitary engineer should look after the city sewers, and should take the necessary steps to insure that they are well flushed and ventilated, and that the catch-basins and street gutters are kept clean. If necessary, he should apply disinfection to the sewers. Medical men should make it a strict rule that all discharges of the sick are disinfected before they

are thrown into water-closets or slop-hoppers, to pass away through the house sewers. The police and sanitary department should prohibit during epidemics the throwing of any evacuations into rain-water inlets, gutters, catch-basins, or privy-vaults. Where there is a sewer in the street, the connection of all houses to the same should be made compulsory. Houses without sewerage facilities, depending upon privy-vaults, earth-closets, and cesspools for the liquid wastes, require at such times more than ordinary attention. Old or badly constructed sewers, generally filled with a mass of putrefying deposits, are particularly capable of propagating an infectious disease through the house connections, the street catch-basins, and the open or ventilating manhole covers. Such sewers will need a thorough disinfection, with either milk of lime or with sulphur. Next to a system of water-carried sewerage, a well-arranged system of dry removal by pails is the best during an epidemic; but the removal must be well organized and occur regularly, and the pails should be well cleaned and disinfected. It is better not to empty privy-vaults or cesspools during an epidemic, except where their contents are first thoroughly sterilized by germ-killing disinfectants.

Where the town sewage is regularly purified before discharge into a water course, the sanitary engineer must watch with care the sewage field or the chemical precipitation tanks. All sewage should reach the irrigation field before it has begun to putrefy. In the field it should be evenly distributed, and all stagnant pools of sewage should be removed.

The utmost cleanliness must be maintained in the streets of the city. All paved surfaces must be regularly swept clean, and the cleaning up of back and front yards, of courts and alleys and street gutters, should not be forgotten. The streets should be moderately sprinkled to lay the dust, which if scattered may carry disease germs into dwellings; if necessary, disinfectants should be added to the water in the watering-cart.

All street dirt, house refuse, and garbage must be removed with particular regularity, for they may contain the germs of the disease. Householders may assist the municipality by burning litter and refuse in the house fires whenever it is possible to do so. Manure pits of stables require careful atten-

tion. In times of epidemics, the destruction of the city refuse by cremation appears to be by far the safest mode of proceeding. The disposal of the garbage by removal offers considerable difficulties even in ordinary times; but during an epidemic the question of removal is apt to be particularly embarrassing, for the very act of removal may cause a further spread of the dreaded disease, and quarantine laws will in many cases render removal out of town utterly impracticable. On the other hand, the sanitary engineer must avoid at such times the accumulation of large masses of putrefying garbage and offal at any point within the city limits; hence sanitation by fire seems about the only solution of the problem.

The battle against filth diseases always requires the maintenance of absolute purity of the soil, the air, and the water. While general cleanliness, light, air, and water are the best available general means of disinfection, it is necessary, during epidemics, to provide well-appointed places for a proper disinfection by steam of all wearing apparel, and of the washing of those who have been taken sick. Disinfecting stations for persons, such as were used in Stettin in 1870–71, and exhibited by Professor Petruschky, of Königsberg, at the Berlin Hygienic Exhibition of 1883, are also to be recommended. In these the persons take an ablution with antiseptic soap under a shower or rain-bath, while their clothing is disinfected for about twenty minutes by steam. Following the douche, bath attendants wash the whole body of the bathers thoroughly with permanganate of potash solution.

If proper care is exercised in the maintenance and management of public baths, it is not always necessary to close these places when an epidemic occurs, for this would deprive many people, who have no facilities for thorough ablutions at home, of the chance to keep their bodies clean, a measure which in itself tends to prevent infection. The public wash-houses, however, should be closed, and physicians should insist that the dirty linen of all patients is sent to the disinfecting station.

The municipal engineer must also see to it that all public water-closet conveniences and public urinals are kept scrupulously clean, well flushed, and disinfected, while the sanitary engineer in private practice will be kept busy with inspections and tests of plumbing work in dwellings, office buildings,

stores, and institutions, and with the more or less extensive alterations of the plumbing and drainage, with a view of making the same safe from a hygienic point of view.

A sanitary survey of the city and a house-to-house inspection will enable the sanitary engineer to know beforehand the actual condition of the worst city districts, generally the tenement quarters of the poor population. Efforts should be made to improve the obtaining conditions, particularly in regard to overcrowding and cellar habitations. Public lodging-houses should be put under close surveillance. In hotels those rooms which may become infected by a patient ill with the disease should be properly disinfected, and the carpets, furniture, and bedding must be destroyed. Attention should be paid to public vehicles, particularly to cabs in which patients may have been transported from the houses to the hospitals. This should always be avoided by providing separate ambulances for the infected.

As a further measure to protect those who are not sick, it is advisable to close, at the very beginning of an epidemic, all public halls and places of amusement, likewise the public schools, colleges, and boarding or private schools. If the epidemic spreads, it may be better to close up the factories and workshops. The shipping of freight should be stopped, travellers' baggage must be disinfected, and railway-stations and railroad-coaches as well as ships inspected.

Then, again, there must be efficient measures for the isolation and care of the sick: first, in order not to endanger those who escaped the scourge; second, to cure the sick. An efficient ambulance service should be organized, largely composed during epidemics of volunteer aid corps, like firemen, policemen, militia soldiers, as the regular hospital service of a city will at such times prove insufficient. The sanitary engineer may be called upon to provide temporary tent or barrack hospitals, where the city hospital accommodations do not suffice to care for the sick. As the school-houses are closed, such buildings may be utilized for hospitals. Military barracks and stables may often be used for the same purpose, while theatres and churches are not as suitable. The temporary barracks, while constructed of woodwork, should be arranged in a manner to keep out the cold. Besides pro-

vision for heating, they should have hot and cold-water service, bathing facilities, sewerage, and electric lighting. The location for hospital barracks should be carefully chosen, and in case of an epidemic it is far better to keep them within short distance of the crowded city districts, rather than locate them at the outskirts of large towns.

Finally, the dead must be cared for. These should be quickly removed from the hospitals and from the poorer and crowded city districts, using extra precautions during removal and transportation against infection. During epidemics, the final disposal of the dead bodies by cremation offers important advantages.

In case of sudden pestilence, many people who are able to do so leave the infected city and fly to camps of safety, erected with refuge huts and refuge tent hospitals. In these, too, the sanitary engineer may find opportunity to assist in maintaining sanitary conditions, by attention to those requirements which at other times form together what is known as "camp hygiene." Such "tenting out" always necessarily involves more or less exposure to the vicissitudes of the weather, and may cause sickness of a preventable nature.

Wherever possible, one should prepare beforehand for the emergencies likely to arise during an epidemic. When the writer was in the Prussian military service, twenty years ago, as a volunteer in an engineering regiment of the Imperial Guards at Berlin, he was ordered for a few weeks to the headquarters of the general military staff, under General Moltke, and he well remembers how he assisted then in preparing beforehand the railway time tables required for the quick moving of the bulk of the German Army to either the French or Russian frontier in case of a future war. Similarly should the sanitary engineer and the health officer lay out beforehand all the plans required to assist in the fight against infectious disease, so that when an epidemic does occur, it may not find them unequipped and unprepared.

II. *Work of the Sanitary Engineer in Time of War.*

In case of an outbreak of war, the civil engineer will be chiefly concerned with the provision of proper means for the speedy and safe transportation of large masses of troops, in-

cluding their necessary ammunition ; with the laying of temporary railroad tracks and the erection of temporary bridges or the construction of pontoons over streams ; or with the destruction of the enemy's railroad lines or rolling stock and the burning of bridges. The work of electrical engineers will consist in the erection of signal stations, the laying of military telegraph lines, and the provision of portable electric-light apparatus for the search of the dead, the aid of the wounded after a battle, and for the disinfection of the battle-field.

The duties of the sanitary engineer in time of war will embrace something like the following—viz.:

1. Providing proper facilities for the temporary housing of soldiers, and selection of proper sites for military camps.

2. Enforcement of cleanliness in the camp ; examination of sources of water supply ; purification of water and provision of an ample supply for the troops and horses ; drainage, removal of wastes and garbage, and erection of latrines ; also safety measures against fire.

3. Provision and transportation of a proper food supply.

4. The first aid to the wounded on the battle-field and at the dressing stations.

5. The care of the wounded ; erection and fitting up of temporary field hospitals, and means for heating and ventilation and electric lighting ; transportation of the wounded from the battle-field, and organization of a field ambulance service.

6. Care of the sick in tent or barrack hospitals.

7. Sanitation of the battle-field and care of the dead soldiers ; also the cleaning and disinfection of camps, the destruction of temporary hospitals, and the disinfection of putrefying battle-fields.

The sanitary engineer, through his practice in times of peace, is rendered particularly qualified to assist in the housing of an army of troops in the field, to give aid in the care of the sick and wounded, and to prevent in military encampments war pestilence, or diseases and deaths due to deficient sanitary conditions.

Statistics record the fact that for every soldier who dies in or after a battle, there are two who fall victims to disease, and that for one soldier discharged as disabled and wounded,

there are three who are more or less permanently disabled by disease. At the Shipka Pass, during the Russo-Turkish War in 1877, the daily losses from bullets were far exceeded by those from frostbite. Ours is not a military nation, and during peace we do not keep a large standing army; but those European nations who are obliged always to be on a war footing pay, since the Crimean War, a great deal of attention to sanitation. After the battle of Balaklava and during the siege of Sebastopol, in the Crimean War of 1854, the English Army suffered immense losses from sickness in the camp. It is stated that of 100 sick soldiers in the hospitals, only 11 were soldiers wounded in battle; 46 per cent of the sick died from fevers. It was then that England sent the well-known Miss Florence Nightingale with 40 assistants to the seat of war, and she succeeded in reducing the mortality of the English troops by enforcement of practical measures of sanitation.

Military camps should offer to the soldiers shelter against sun and heat, against rain and damp, against wind and storms. In order to be healthful, such camps require an elevated site and a dry subsoil, with good drainage facilities and means for a pure water supply. In choosing and locating camps, the sanitary engineer can render efficient service by making preliminary topographical surveys and avoiding all unhealthy sites, the neighborhood of marshes or swamps or alluvial river bottoms, subject to overflow, which tend to foster malarial conditions. If compelled to erect a camp in such a situation, it should be placed well to windward of all suspicious grounds.

Old camp grounds had better be avoided on account of the likelihood of a previous soil contamination and the possible incidental danger of infection. Hills and woods serve as protection against winds, and the woods also for shade in warm climates.

Cleanliness and healthful conditions must be maintained in camps. Dryness of soil is essential, hence the first care of the sanitary engineer should be to arrange for proper surface drainage, and to provide against floods or excessive rainstorms. He should also make provision for a good water supply, arrange for the disposal of slops and waste water, and erect suitable latrines or plain earth closets. Facilities for performing bodily ablutions, including simple bathing arrangements,

should be contrived, as well as means for washing the underwear and cleaning the clothes and blankets of the troops. For although the out-door life of military service, and the camping out under the open sky tend in general to favor healthful conditions, the want of cleanliness, particularly in the field or during and after long marches, may be a fruitful cause of disease.

The camp should be inspected daily. A regular system of scavenging should be instituted, order and cleanliness must be maintained, and the danger of fire must be guarded against. The latrines must be carefully looked after, and likewise must all kitchen refuse be removed to a safe distance. The stable manure of cavalry or artillery encampments should be carted away regularly, and dug into the ground. Soil pollution by the voiding of urine in other than the designated places should be prevented by strictly enforced regulations. Finally, a small field hospital should be erected, either of log-huts or of tents, to care for the sick.

When a battle has taken place, humanity demands the early search for, and the immediate first aid to, the wounded, to friend and foe alike, and considerations for the health of the surviving as well as piety require the burial or disposal of the soldiers who fell in battle and of the horses killed. Warm weather and moisture combine to create very soon conditions of war pestilence dangerous to health, unless immediate attention is given to the sanitation of the battle-field.

After the battle of Solferino, on June 24th, 1859, not less than 40,000 wounded covered the field, laying exposed to the hot summer sun, which soon changed all into a mass of putrefaction and pestilence. Henry Dunant, a citizen of Geneva, Switzerland, witnessed these shocking sights a day after the battle, and described them in his book, "Un souvenir de Solferino," which gave the first impetus to the founding of the Red Cross Society, at Geneva, on October 26th, 1863. Colonel Naundorff, in his book, "Under the Red Cross," gives a similar vivid description of the horrors of the Königgrätz battle-field. It took, after the battle of Gravelotte, in the Franco-Prussian War of 1870-71, four days to remove the wounded and dead, and after the battle of Sedan it took six days to accomplish this. Nowhere, however, have the hard-

ships of war and the horrors of the battle-field been depicted with a greater master hand, more vividly and realistically, than in Verestchagin's world-famous war paintings, the scenes of which are taken from the Russo-Turkish War. The sights which he saw in actual military service were so forcibly impressed upon his mind, that the paintings which he created after the war speak eloquently for themselves. The message conveyed to us by his works cannot fail to teach a lesson and to awaken sentiments in opposition to warfare; at the same time they point to the urgent necessity of civil aid upon the battle-field.

What may be accomplished at such times by civil aid has been well illustrated in the excellent work done by the United States Sanitary Commission in the War of the Rebellion of 1861–64. The barrack or pavilion system of hospitals was originated by this commission, and has had a powerful influence in changing the general plan and arrangement of hospitals, and in emphasizing the importance of securing ample ventilation to such structures. The well-known German surgeon, Professor Frederick von Esmarch, made a powerful appeal for civil aid in his famous essay, "The Battle of Humanity against the Horrors of War," published in 1869.

In England John Furley founded in 1877 the St. John Ambulance Association of London, and Esmarch followed soon after in Germany by the establishment of "Samaritan Societies," which he aptly calls the "Pioneers of the Red Cross."

In addition to the aid given on the battle-field by volunteer aid corps, the regular military hospital and field ambulance corps attend to the wounded during and after a battle. It is usual to distinguish three series of stations—viz., the first, dressing station, near the line of battle, where the wounded receive the first aid, and where the temporary bandaging of wounds is done; second, the field hospitals, composed of tents or barracks located from two to three miles behind the line of battle, to which the wounded are removed in field ambulances, and finally the general war hospitals, which are stationary but usually temporary structures, located at greater distance from the seat of war, and to which the wounded are transported by hospital railway trains or sometimes by hospital ships.

After the battle the dead must be cared for, generally by interment in large common graves, and sometimes by cremation. The introduction of the movable electric-light wagons in the military service has aided greatly in accomplishing this more quickly; at the same time it may render useful services in the early disinfection of the battle-field to avoid war pestilence.

III. *Work of the Sanitary Engineer after Sudden Calamities, Catastrophes, and Great Disasters in Civic Life.*

Many opportunities offer themselves to the sanitary engineer for rendering useful services in case of accidents or sudden calamities, like earthquakes, floods and freshets, destructive conflagrations, tornadoes and cyclones, forest fires, collapse of buildings, machinery accidents, boiler or powder explosions, railway disasters, and accidents in mines.

After a storm flood, caused either by river overflows or by the breaking of dams or water reservoirs, the entire flooded district must be drained, and its habitations must be rendered healthful by artificial drying; but as this requires considerable time, it is often necessary to erect temporary barracks for shelter, as many people will suffer from lack of homes. All dampness must be removed, disinfection applied whenever necessary, and in houses with deafened floors the wet filling-in material should always be removed, as it may breed disease. After deplorable calamities, such as the flood at Johnstown, Pa., May 31st, 1889, caused by the breaking of a dam above the town during an extraordinary rainfall, and the almost entire destruction of the city of Szegedin, in Hungary, in March, 1879, by a river freshet, both of which caused much loss of life, the services of sanitary engineers can be put to good use.

Similar aid may be rendered after destructive earthquakes, or great conflagrations, or devastations by tornadoes. Panics and fires in theatres, or in orphan asylums or hospitals for insane, are terrible calamities, often accompanied with appalling loss of life. Here, again, the knowledge of sanitary engineers can be applied and efficient services rendered, first of all, in providing measures for preventing the recurrence of such catastrophes; and, second, in rendering aid when such accidents have happened.

Then, again, we have a large number of accidents, such as collapse of buildings or grand stands, railway disasters and bridge accidents, injuries in industrial or manufacturing establishments and in workshops, due to unprotected machinery in motion or to defects of hoisting apparatus; blasting accidents, fire-damp explosions in mines, caving in of trenches in earth excavations for sewers or water-pipes, suffocation by escaping illuminating gas in laying gas mains, collapse of tunnels; steam-boiler explosions, and explosions of gunpowder or dynamite.

In the construction of architectural as well as engineering structures, accidents to the superintendents, to masons, bricklayers, roofers, and other workingmen are of frequent occurrence. There are injuries due to falling stones, brick, or timber, falls from scaffolds or ladders, derricks and hoisting accidents. In carrying out large railroad or canal enterprises, it is usual to provide beforehand temporary barrack hospitals for the care of those who may become in any way injured or who succumb to disease.

In view of the frequency of accidents in architectural and engineering works, a general course of instruction of first aid in emergencies and accidents has been introduced at all the German Polytechnic Schools. While it is true that the knowledge of how to render the first aid in injuries until a surgeon arrives, should be a part of every man's general education, and while it is by no means claimed that the engineer is specially qualified to render such service, the matter is mentioned here because, through the nature of his work, he is apt to be frequently present at, or to be brought into immediate contact with, such accidents when they do occur, and it is desirable that he should in such emergencies know what to do to make the injured person as comfortable as possible until medical aid arrives.

The engineer should, therefore, know the rudiments of anatomy and physiology of the human body, and be conversant with fractures, sprains, dislocations, contusions, crushes and lacerations, and bleeding or poisoned wounds. He will meet cases of torn limbs, of splinters, wounds, and hemorrhages, sun and heat-strokes, frostbite, foreign bodies in the eye, as well as cases of drowning, of suffocation with smoke

or illuminating gas, or bad gases at the bottom of wells or vaults. He may be called upon to treat burns, scalds, or in chemical works cases of eschars or poisoning. He should also be familiar with the extemporized means of transporting injured persons, when accidents occur in places far away from doctors, as in surveys in the woods, in the climbing of mountains, on the ranches in the far West, on board of ships or trains, or in mines.

No one has done more efficient service in popularizing this useful knowledge than Professor Esmarch, who founded the German Samaritan Society, and in February, 1882, delivered his first course of lectures on first aid to the injured, which have since then been time and again repeated by others. In Vienna a Volunteer Aid Society was founded a day after the terrible fire of the Ring Theatre, on December 8th, 1881.

In England valuable work is being done by the St. John Ambulance Association, founded by John Furley, Esq., and in Scotland a similar society exists and is known as the St. Andrew's Ambulance Association.

In New York City the Society for Instruction in First Aid to the Injured was founded many years ago, while in Brooklyn a similar society, known as the Red Cross Society, is doing excellent work.

It is a matter of gratification to record the fact that, after the formation of a United States Committee of the International Red Cross Society, whose work was until then confined to civil aid on the battle-field and in the war hospitals, it was proposed and advocated, largely by Miss Clara Barton, that the usefulness of the Red Cross Society might be increased by relief work in cases of calamities *other than war*. This accepted amendment to the constitution of the Red Cross Society is known as the "American amendment," and by it the aid of the society is now extended to sufferers by flood, pestilence, tornadoes, and other great disasters in civic life.

MONTEFIORE HOME FOR CHRONIC INVALIDS.—This charitable retreat of New York City has received gifts amounting to not less than $50,000 toward a fund for the establishment of a country home, chiefly for persons in the early stages of tuberculosis, to be situated in the Adirondacks or at Vineland.

THE PERIOD OF DEATH AS INDICATED BY NATURAL HISTORY.*

By T. P. CORBALLY, A.M., M.D.

NATURAL history sometimes throws an unexpected light on doubtful questions relating to medicine. If for any reason it is desired to know how far back the death of a subject occurred, which may be found in a state of putrefaction, or in a state more or less advanced in decomposition, information may be thrown on the subject by the naturalist, from the character of the insects that are found in it; and a knowledge of the successive transformations to which they are subject will enable him sometimes to determine, with more or less precision, the probable period to which the death may be referred. M. Meguin, in a note on the subject to the Académie de Médicine (*La Gazette Hebdomadaire*), says that—

"In dead bodies exposed to the air, myriads of worms are developed which are the larvæ of flies; there are also the larvæ of coleoptera, of lepidoptera, and of acariens. This multiplication is sometimes so great that Linneus was justified in saying that 'three flies consume a carcass as quickly as a lion could do it.'

"The insects attack the body successively, and I have been able to count eight different species of these insects, which succeed one another from the time of death until the complete destruction of the body.

"This succession is due, no doubt, to the fact that the different modifications which produce the putrefaction attract them in regular succession.

"The study of the succession of these different detachments of workers enables us to find in the observation of their habits real animated reactives, the indicators of the time which has elapsed from the moment of death, especially when the corpse has not been placed under ground.

"The following is the list of the successive detachments of these workers:

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* Translated for THE SANITARIAN.

"1. The fly of the courtanevra and the calliphera species, which live on flesh relatively fresh.

"2. The fly of the Lucilia and sarcophaga species, found from three to six days after death.

"3. The coleoptera of the species Dermesta and the lepidoptera of the species Aglossa, which appear after three or four months.

"4. Flies of the prophila and anthonga species, and coleoptera of the species necrobia. Flies of a species resembling those found in cheese, and which indicate, as in cheese, the casseous formation. They indicate that death had taken place about eight months before.

"5. Flies of the opiraphora and tyreaphora species, when the cadaver is about a year in existence.

"6. Coleoptera, insects of the silpha species, hister and saprinas, acariens detricoles, of the group tyroglyphines, complete the absorption of the liquid humors; this continues until about the eighteenth month.

"7. Insect coleoptera and lepidoptera, which gnaw the dry tissues, the skin, tendons, hairs, etc. Their work is completed with the third year.

"8. The last group, which lives on the remains which were left by the preceding coleoptera, of the species tenebrio and patina. We have found them in bodies four years after death."

"LET THE INEBRIATE SMILE AGAIN"—A HINT FROM NORWAY.—A valuable hint comes to us from Norway. The way seems to be opening up for a form of moderate excise legislation that will in the long run be in the best interests of the lovers of alcohol. In Christiania, the capital of that land, no sale of beer or spirits is now permitted from Saturday afternoon to Monday morning, except to permanent guests residing at respectable *cafés*. This regulation has led to such a great diminution in the consumption of drinkables that the publicans have begun to complain that the liquor trade is no longer profitable. One day's break in the week is enough to show a great many imbibers the advantages of abstinence, even if it be limited in duration.

INFECTIOUS DISEASES IN PUBLIC SCHOOLS.*

By MOREAU MORRIS, M.D., Sanitary Inspector, Health Department of New York.

YOUTHFUL life in our public schools is in constant jeopardy. At this period of life exists the greatest susceptibility to infectious and contagious diseases.

Pathogenic germs, invisibly floating in the atmosphere, are ever liable to enter the unprotected system by inhalation and absorption. The arterial circulation, spread out over an extensive lung surface, affords a ready inlet to and means of circulating these germs. The blood thus becomes poisoned with germinal secretions.

After a period of generative incubation, the whole animal economy succumbs to this foreign invasion. Overwhelmingly they succeed, and with renewed life and vigor proceed to attack other subjects who may not have become immune, or for some unknown reason are not susceptible to them ; but these are few.

These school congregations of youthful victims consequently present fruitful fields for further development and dissemination of pathogenic germs, and if, on their introduction, prompt and efficient measures for their suppression are neglected, epidemics of alarming proportions speedily ensue.

Under such circumstances school attendance diminishes, households watch with anxious fear their little ones, and in extreme cases schools are temporarily closed. Whole communities become alarmed, until the visitation disappears for want of susceptible victims, leaving many sad hearts and mournful homes.

Preventive measures therefore become a public necessity and duty. Physicians as well as health officers are directly responsible for the promulgation and exercise of every recognized means for prevention with every case coming within

* Paper read at meeting of the Section of Pediatrics, New York Academy of Medicine, February 14th, 1895.

their knowledge. To neglect this obvious duty seems almost criminal.

It is within the power of every medical practitioner to direct and have enforced such measures to prevent the spread of infectious disease beyond the suffering patient. There are such measures and methods now established, which, if vigorously and conscientiously enforced, in every case coming within the knowledge of the general practitioner, would, as a rule, arrest the further spread of any contagious or infectious disease. Sanitary precautions should never be neglected under any circumstances.

Parents or members of families are, with few exceptions, ever ready and anxious to carry out any directions the medical attendant can suggest, looking to him as their adviser and friend, to protect other members of the family as well as to treat and save the life of the patient. It should be indelibly impressed upon every medical man's mind, that to stamp out all sources of infection that may proceed from the first recognized case is a paramount duty he owes not only to his patient's family, but to the public.

In the household it is possible to segregate the individual, and with proper sanitary measures prevent the spread of such diseases; but in the schools other conditions prevail. The community of children is of the most intimate character, personal contact unavoidable, and the susceptibility so great, that, without immunity already established, many must fall victims.

The special conditions of school life are entirely different from domestic life. Under school discipline the child becomes but a fractional part of the integral. Classified by grading, it must necessarily lose a portion of its individual identity, and conform to established rules and regulations. It must, so to speak, "go with the crowd." In its class, it must be intimately associated with other members, breathe the same air, come into personal contact and be subjected to the influences, physical, mental, and moral of its fellow-members; and these postulates pertain to the whole school.

When we extend these conditions to the whole public-school system, it is readily seen to what an extent the youthful life of the school children, numbered by the hundred thousands

in this great city, is exposed to the dangerous elements of infectious and contagious diseases.

No more important subject could be presented to the boards of management of our public schools, nor to those in authority as conservators of public health, nor to the individual medical practitioner, than that which concerns the prevention of the spread of contagious diseases. Each in his own special function necessarily must assume his share of responsibility:

The school board for the overcrowding in insalubrious quarters, the limited number of school buildings, unable to accommodate the rapidly increasing number of applicants for admission, the apparent inability—it might almost be said indifference—of the board to apply hygienic laws, imperatively demanded by sanitary science and advancement in the lines of progress with all that pertains to public-school education and healthful environments.

The Health Department, for efficient service in stamping out contagion, whenever it may become informed of its presence, by the use of such means and methods as in its experience it has found to be effectual, whether in public places or in the individual household. The medical profession, in its intimate social family relations.

All should assume and bear correlatively, and each some of the burden of this responsibility.

SOURCES OF INFECTION AND CONTAGION.

With reference to sources of infection in public schools, an investigation and personal interview with a large proportion of the principals and teachers in many of them presented the fact that there were several sources from which infection and contagion might be transmitted unwittingly among the school children.

It was found that school books were almost universally covered with some textile fabric of muslin or cloth—a facile means for germ propagation—and that such books were frequently returned to the school after being in possession of the scholar who had passed through an attack of some contagious disease.

Moreover, I do not deem it out of place in this connection to invite attention to the filthy condition of many of the books in the circulating public libraries, where books are being con-

stantly given out indiscriminately. Many of them are seen to be covered with paper greatly soiled, while the leaves bear evidences of contact with dirty fingers, oftentimes polluted with saliva or other media capable of transmitting infectious diseases.

Circulating library books, bearing evidences of such impurities either on their covers or leaves, ought to be burned, and new ones substituted rather than that even one person should become a sufferer by contact therewith. Possibly a means of thorough disinfection might be applied to every book returned to the library before its reissue, unless its begrimed pages should confine it to destruction by "fire."

Next in order were found the use of slates, slate-pencils, lead-pencils, and pen-holders, all used indiscriminately from day to day, without any special cleansing, being collected at the close of school sessions, to be distributed on the day following. In one or two instances the principals have directed the children to take the slates home once a week, and have the wooden frames thoroughly cleansed with soap and water. This precaution, so far as it goes, is praiseworthy; but unless the slates and pencils could be individualized, it is of small avail against the spread of contagion. Fingers wet with saliva, erasing words upon a slate, may convey the bacilli of diphtheria, should such disease happen to be present in the child's throat, especially during the early stage, before it may have been suspected.

Notwithstanding the injunctions of the principals and teachers, and furnishing of small sponges or rags moistened for erasing pencil marks on slates, no class among the hundreds under observation was found to be entirely exempt from this habit, to the evident mortification of the teacher, who had asserted that such habit did not exist in the class. Children in the lower grades, where slates principally are used, have not yet learned to obey implicitly such rules, and the almost natural instinct is to wet the finger with saliva to rub out the mark or word.

In the higher grades the use of paper pads with lead-pencils or pens is the almost universal practice, usually each scholar having an individual supply of pencils and pen-holders.

But it is not so in all schools; many are indiscriminately supplied daily from the collection of the previous day.

In this connection it seems incumbent to speak of the common habit, which was noted in the class-rooms, and may be daily observed in almost universal practice, of wetting the end of the lead-pencil before using it. With a hard lead-pencil, wetting its point makes a more distinct impression; but none the less, this habit is very objectionable.

Unpleasant if not dangerous affections of the lips or tongue may be a result, and if perchance that dreaded bacillus of diphtheria should chance to be present, no more direct means could be devised to transmit it, especially where, as in these schools, pencils and pen-holders are distributed daily indiscriminately.

Another important factor for the dissemination of infectious diseases may be found in the storage of the outer garments during the school session. In the majority of the schools closets are provided in each class-room for hanging up these garments. They are not separated, but hung in mass. The offensive odors therefrom, especially on damp or wet days, are most objectionable, in a class-room, without proper means of ventilation and an overcrowded occupancy, as the majority of the class-rooms are found to be. Not only are these odors so objectionable, but a greater objection may be found in the possibility of conveying contagion from garment to garment. This dissemination would not be confined to the school children, but might be carried home to infect other children too young to attend school.

It seems to be hardly questionable that the toleration of these methods, practices, and habits, as described, are in a large measure conducive to and chargeable with the spread of infection in the public schools. And when it is remembered that from one to two thousand and more children are daily congregated in these great caravansaries, from every variety of domicile and domestic condition, it may be no small wonder that infectious and contagious diseases are at the present time so well held in abeyance.

Unquestionably this result is due, in no small degree, to the increased intelligence among the educated classes with regard to the sources of disease, general hygiene, and practical application of sanitary science in prevention of the spread

of such diseases, as well as by the efficient methods of the Health Department.

It is but a few years, comparatively, when to forcibly take a patient suffering with small-pox from his home to a small-pox hospital, without his or his family's consent, was a dangerous proceeding. It is with a vivid recollection I recall the first case presented for this summary proceeding which was ordered by the Health Department to be so removed. The patient was lying in a small bedroom on the second floor of a large tenement-house. In the larger adjoining room was the father, coatless, doors locked and barred and barricaded with furniture, defying the Board's officers, with pistol in hand, threatening to shoot the first man who should enter. The door was burst open by main force, the health officer entered, and in the presence of a police officer the man dropped his pistol and remained a quiet spectator, while the patient, a young man of about twenty years, was wrapped in blankets, carried down-stairs, and removed to the small-pox hospital. The man's castle had been invaded, the contagious enemy captured and carried off, where the public would be no longer endangered by his presence.

This method of segregation and isolation, with the practice of vaccination and disinfection, has resulted in controlling eventually the spread of that disease.

This instance illustrates the great change that has taken place since in the progress of sanitary education, not alone among the educated, but also among the masses. Proceedings that were once denounced as infringements upon personal rights and liberty are at the present day not only tolerated, but eagerly sought for, recognizing the personal obligation to the greater body politic. That even children recognize the advance methods of the present day, a little incident that occurred but a few weeks since in one of our Sabbath-schools will show.

The teacher asked the class of boys, all under ten years, "What did Christ tell the leper whom He cured to do?" *Answer.* "He told the leper he must go to the priest." "Well, what would the leper do in the present day?" *Answer.* "Oh, he would go to the Board of Health and get disinfected—smoked out with burning sulphur."

The advance of sanitary knowledge, and especially the discoveries in the progress of bacteriological science during recent years, have brought to view definite and specific knowledge, which shows the elements in the causation of disease of various kinds. So, too, it has discovered, and continues to discover, which of these elements or germs are specific, and what other elements there are to combat and overcome these destructive germs and their products, and what measures and methods are best suited to destroy them and so prevent their spread.

With this view every known or recognized means of prevention—especially among school children—is justifiable, and it is the constant study among health officials where, when, and how to apply the most effective means of prevention. Chief among these is isolation and disinfection.

To isolate and quarantine the first case discovered is to prevent its further spread. To destroy by disinfection the invisible germ is to arrest further development and thereby—to use the familiar term—stamp it out.

But the migrations of disease germs are as yet so little comprehended, that knowledge of means is still lacking to entirely compass their destruction. However, considering the rapid advancement of bacteriological knowledge during recent years, and the number of enthusiastic investigators engaged in its prosecution, the day cannot be far distant when the most, if not all, of these life-destroying germs will be brought under subjection.

Recent discoveries have brought under subjection that most fatal of all children's diseases, diphtheria. The antitoxine treatment already counts a very large percentage among the saved, and its further progress in the perfection of methods may possibly secure the extinction as a life-destroyer of that dreaded disease.

PRECAUTIONS.

The outer clothing of scholars should be placed in closets outside of the class-rooms, and some simple and efficient means adopted for disinfection while so placed. Every scholar should be compelled to come to the class room with clean face, hands, and nails.

By personal inquiry and observation it is gratifying to know that principals and teachers exercise the utmost care in watching for dangerous illness among their young charges.

If there are any suspicious symptoms evident, the scholar is immediately sent home, and no child is readmitted to the school after having had any contagious disease without the official assurance of a clean bill of health from the Health Department. Where there has been a medical attendant who has properly complied with the law in reporting his cases to the Health Department, this assurance can be given; but when such cases have not been reported, or there has been no medical attendant, the child may resume his attendance by the deception of parents or scholars, who will deny there has been any contagious disease in the case. A mild attack, with slight eruption of scarlet-fever or of measles, is popularly considered to be non-infectious, consequently such children escape medical observation, and oftentimes are sent to school during the progress of the disease to convalescence before complete desquamation has taken place. This process is a most prolific source for spreading disease, as all intelligent physicians must know.

Hence the constant danger to school children which the utmost watchfulness and care cannot entirely avoid. Again, with incipient diphtheria: a child may complain only of a slight sore throat; it is allowed to attend school, its promotion in school grading inducing both it and its parents to continue its attendance. Sitting close to its school-mate, who must necessarily inhale some of its breath, or possibly use the slate which has been treated with the spittle-cleaning process, what must be the result—another victim to suffer, and more still to follow possibly from this exposure.

Every scholar found to be suffering with sore throat should be immediately sent home from school, and not readmitted until it is well.

For some years it has been the practice to send daily a list of the location of all contagious diseases to the Board of Education by the Health Department.

This list is arranged by the Board of Education, so as to be forwarded to the principals of all the public schools, conveying the information of all cases that may be within a certain

area of each school. By this means the principal can be informed if there are any scholars in attendance coming from those localities, and if living upon the same floor, must be excluded from school until such time as they can bring a certificate from the Health Department that it is safe for them to enter. Two or more cases upon different floors, or a case of small-pox in any house, exclude all children from school residing in the house.

All children are required to present a certificate of vaccination, either from the medical attendant or from the Health Department, before they can be admitted to any public school, and inspectors of vaccination from the Health Department visit the schools at regular intervals, who examine the evidences of previous vaccination, and if such has not been performed during the past seven years, with the consent of the parents, they are revaccinated. Since this method has been adopted, small-pox occurring among public-school children is unknown.

In addition to the daily list of contagious diseases sent to the Board of Education, whenever a case of contagious disease is reported to the Department, a sanitary medical inspector visits the case, and leaving general directions with the family or physician in attendance respecting isolation and disinfection, a part of his duty is to send by a postal-card the information of the case, and the exclusion of the children of the family or house, as the case may be, to the principal of the school or schools where they attend.

By these means it would seem that every feasible precaution would be taken to prevent the spread of such diseases in the schools that experience has suggested.

A system of what might be termed *sickness records* might be instituted for the benefit of school sanitation. For instance, a record of all absentees from each class-room, on account of illness of whatever kind, might be kept each day, to be summarized at the end of the week by each teacher, and forwarded either to the Board of Health directly, or to the Board of Education to be forwarded to the Board of Health for investigation.

The importance of this information may be seen in the fact that has occasionally been discovered, that a succession of

cases had followed an outburst of infectious and non-infectious diseases in some particular class-room. A special examination of such class-room, by a sanitary expert, would probably discover the specific cause of such continued cases of illness, in some specially unsanitary condition easily remedied once the cause became known.

In conclusion, I may be permitted to reiterate the salient points intended in the presentation of this paper, especially as it is prepared for the information of the medical profession with reference to this specific subject, "Infectious Diseases in Public Schools."

1. The great importance of early and prompt reporting of any contagious disease occurring in the practice or knowledge of every physician to the Health Department. Postal-cards are furnished upon application for this purpose free.

2. That the medical profession, so far as it is possible, in their family intercourse, impress upon the minds of their patrons the fact of the communicability of any contagious disease, however mild may be its manifestations.

3. That the Board of Education may be induced to adopt the suggestions relating to the books, slates, slate-pencils, pads, and lead-pencils, and care of outer clothing during school sessions, in view of the danger of communicating and spreading contagion among the scholars of public schools.

4. The exclusion for a time of children coming from infected premises, before a thorough disinfection has been performed.

In the manual of the Board of Education, under the heading of "Sanitary Regulations," specific rules and regulations for the guidance of principals and teachers, with reference to contagious diseases, are given, providing that children must not resume their attendance without producing a certificate from the Board of Health, stating that it is safe for them to do so.

Other unhigienic and unsanitary conditions which affect the health and lives of school children, such as overcrowding, improper methods of ventilation, offensive odors from faulty construction and improper location of sanitary appliances or defective plumbing, absence of out-door playgrounds, hasty mid-day meals, etc., have been purposely excluded from this paper, not being directly pertinent to its specific subject.

How far these conditions, deleterious to general health, may be predisposing causes for susceptibility to contagious diseases every physician is well aware.

No argument is necessary to convince one of this fact. It needs only a personal visit to many of the older school buildings while the schools are in session to verify this fact, and even in newer buildings the neglect of constructing proper means for ventilation is unfortunately too patent.

AUNTIE SEPTIC.

By L. D. W.

ONCE upon a midnight cheery, at his work and never weary,
Sang that happy little microbe who torments the editor.
Suddenly there came a tapping, as of some one softly rapping,
Seeking for admittance gently, softly tapping o'er and o'er,
And the microbe smiled complacent, "'Tis my friend and fellow-bore,
Tapping at the chamber door."
But there stood within the portal such a form as any mortal
Would have gazed on with delight, and hugged unto his bosom's core;
Then the naughty microbe started, and his valor quick departed.
"Who are you?" he cried in terror. "Tell me, tell me, I implore!"
"Oh, I am your Auntie Septic, whom you never met before—
Merely this, and nothing more."

Then this little microbe faltered, and his joyous mien it altered,
As he felt determination in his Auntie's grasp full sore;
And he said with agitation, "Can't I seek another station
Where I may pursue my studies, and all the mysteries explore?"
But his Auntie as she clasped him, even closer than before,
Gently murmured, "Nevermore!"

—*The Living Church.*

March 18, 1895.

SEWERAGE IN FOREIGN CITIES.*

AMSTERDAM.

By EDWARD DOWNES, United States Consul.

THE city of Amsterdam has no regular sewerage system. Different systems of discharging and collecting sewage are in vogue. In the old part of the city, surrounded by the Singelgracht,† the sewage in some buildings is deposited in a large cesspool under the cellars. From these cesspools, the superfluous water flows through a sewer from the building to the canal. When the cesspool is filled with solid matter, it is cleaned by municipal laborers at the expense of the house owner. In olden times, this solid sewage was taken from the cesspool at night, placed in large tubs, and deposited in a covered boat on the canal in front of the building. At present, it is forced by hand pumps through a large rubber pipe into hermetically closed tank carts. The process is perfectly odorless. This work is also performed by city laborers at the house owner's expense.

In some buildings the sewage is flushed by means of the surplus water directly from the house to the canal. In other buildings, in the old part of the city, the excrement is deposited in tightly closed tubs furnished by the city, and removed every night by city laborers. In some places, an ordinary bucket is used for the depositing of excrement; this is emptied every evening into a reservoir cart specially adapted for the purpose. A man with a loud rattle precedes the cart to give notice of its coming. The people thus notified bring their buckets to the sidewalk, and when emptied rinse them in the canals.

The rain-water flows overground directly into the canals. Where this is impossible, it is conveyed underground through small sewers to the canals.

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* Continued from page 427.

† The Singelgracht was a canal, which completely surrounded the old fortifications.

The canals are flushed daily by water let in from the Zuider Zee, which flows with a fall of nearly twenty inches through the city to the North Sea Canal. The flushing of the canals may also be effected in a reverse way—viz., by pumping out the water with a steam-engine of 300 horse power, located on the east side of the city, and letting in the water from the North Sea Canal. The heavy stuff which settles in the canals is removed by dredging.

In the parts of the city outside of the Singelgracht, the Liernur system is used for gathering the sewage. This system collects the excrement in a web of closed iron pipes, through which it is forced by atmospheric pressure to a place outside the city. At this place the sewage is prepared by machinery for agricultural purposes, without in any way affecting the public health.

This system was first introduced in 1876, and has since been gradually extended. It was invented by the late Captain Charles F. Liernur, who died at Berlin, February 12th, 1893. It is now represented by the two sons of the inventor, Morris Francis and W. Liernur, engineers, at Saint Cloud, 51 Rue de la Guette, near Paris, France.

The total cost of constructing this system cannot be correctly stated, partly because the building entailed other public works, as the filling of canals, the making of new streets, and partly because the first construction was experimental, resulting later in a definite construction and machinery. However, by taking as a measure the expenses for the different extensions, the cost can be estimated at about $4.80 per head, for those whose buildings are connected with this system, the cost of constructing the pumping station with its machinery included. The cost of the station, excluding the price of the ground, was about $55,000. The cost of erecting the ammoniac factory, with all its machinery, amounted to $34,000. The yearly expenditures for labor, repairs of pipes, streets, coal, etc., is for those directly connected with the system (60,996 inhabitants, at 30 cents per head), $18,298.80; for those using merely the tanks in front of the houses (59,219 inhabitants, at 45 cents per head). $26,648.55; total, $44,947.35.

The total length of the main sewer is about 12,700 feet.

All the sewers are constructed of cast-iron socket pipes of 5, 6, 8, and 12 inches internal diameter. The joints are filled with hemp and lead, like the joints of gas and water-pipes. In most places they are supported by a continuous foundation of piles 39 feet, driven at a distance apart of about 10 feet and connected by beams 4 by 8 inches.

The number of houses connected with the Liernur system is 6619, of which 3031 are situated on streets through which the pipes of the system do not pass.

The sewage of these houses is emptied into iron tanks of 75 gallons capacity, in the street before the houses. These tanks are emptied three times a week by portable pumping machines. The excrement, it is claimed here, is carried by its own weight from the privy, situated in the house, through a pipe to the main pipe in the street.

The "fall" or "standpipes" are carried above the roof, and are left open. The object of this is to permit the escape of sewer gas, and to admit air in the district reservoir, when the side conduits and the main pipes are being emptied. The bottoms of the standpipes, as well as every privy, are provided with an arrangement to keep back any bad smell. The gases from the privy escape through small ventilation pipes leading to the roof.

Exclusive of the laborers at the ammoniac factory, 76 men are daily employed on the Liernur system. Their wages amount to $21,089 per year.

The sewage matter gathered by the Liernur system at the central pumping station is transferred into sulphuric ammoniac. The heavy stuff is first separated from the liquid by lime and a settling process.

The concession for manufacturing has been granted for a term of ten years to a company. The profits of this company, for the past year, amount to $12,000. Half of this sum has been refunded to the city.

Deodorizers are not used. The sewage matter is conveyed through closed pipes. During the manufacturing process, which immediately follows, the lime prevents the escape of any bad odor.

Previous to the introduction of the system in 1869, the mortality of the city was 25 per 1000. During the past year the

mortality was 18 per 1000. This favorable condition cannot be entirely attributed to the Liernur system, which is not used in the whole city. Since the inclosing of the Y (harbor) the canals have been regularly refreshed and the methods of city cleaning largely improved.

The central pumping station connects with 32,809 feet of pipes for the transportation of sewage matter, and with two collecting and thirty-six district reservoirs having nearly 85,300 feet of mains.

EDWARD DOWNES,
Consul.

AMSTERDAM, November 20, 1894.

[The *Liernur system* is fully described, with illustrations, in THE SANITARIAN, 1879, Vol. VII., p. 396.—EDITOR.]

PNEUMATIC SYSTEM FOR SMALL SEWAGE WORKS.

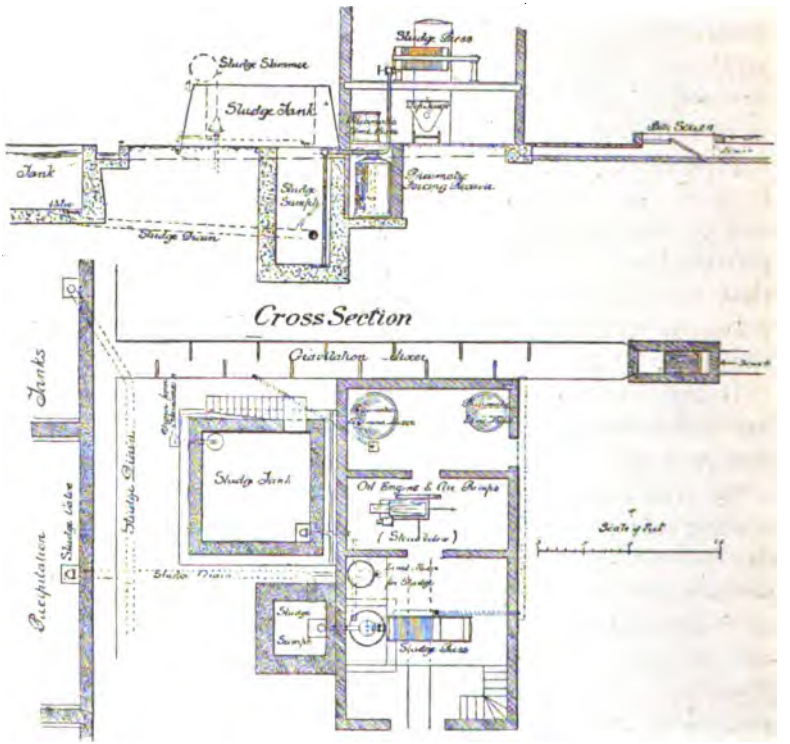
By WILLIAM FAIRLEY, Assoc. M. Inst. C.E.

IN designing plant for the treatment of sewage for small towns of from 1000 to 20,000 inhabitants the principal difficulty has been to reduce the cost of the machinery in first installation and in subsequent maintenance.

The principal objects which should be kept in view to attain this end are the following: That the arrangement should be of the simplest possible character; and that running machinery with complicated systems of shafting and belting should be as much as possible avoided.

The improvements lately introduced into the construction of small motors worked with petroleum have materially helped to reduce the cost of machinery by reducing the outlay for engine, boiler, chimney shaft, etc., and it is well to bear in mind the fact that the cheapest source of power from small motors of this kind is obtainable by the use of petroleum engines. Their running expenses per horse-power are very much less than those of any small steam engine; and, as compared with gas engines, gas will only be equal to petroleum in cost as a source of power when the price at which it is supplied is under 1*s.* per 1000 cubic feet. Almost any

ordinary petroleum can be used with these engines. The Anglo-American "Royal Daylight" oil can be procured, delivered on to the sewage works at 4*d.* per gallon, or less, allowing for the return of empties; and a consumption of oil not exceeding three quarters of a pint per horse-power per hour may be relied on; so that an engine developing six effectual or brake horse-power can be worked for twelve hours at a cost for petroleum of 2*s.* 3*d.*



PLAN.—SEWAGE WORKS ON THE PNEUMATIC PRINCIPLE.

Messrs. S. H. Johnson & Co., of Stratford, with the object of simplifying the plant used on such small sewage works both as to general arrangement and economy of working, have devised a system of operating the whole of the machinery in a sewage works by means of vacuum or compressed air, and by combining an oil engine with a set of high and low-pressure compressed-air pumps and a vacuum pump, uniting all in a

single machine, and by the employment of the low-pressure air service from the low-pressure air pump to work the various chemical mixers for the treatment of the sewage and the liming of the sludge on the principle of their patent pneumatic mixers. And using the high-pressure compressed air not only for forcing the sludge into the sludge presses, as has hitherto been done, but also by the employment of a vacuum arrangement, they dispense with the use of sludge pumps, making use of the pneumatic forcing receivers. By putting the receivers in connection with the vacuum pump they are speedily exhausted and filled with the sludge, and by a simple switch valve the air ports on the air pump are reversed, and compressed air is forced in over the sludge in the receivers. The inlet valve to the sludge receivers is an ordinary self-acting flap valve, which immediately closes, and the sludge is forced from the receivers into the overground sludge store tank, the end of the rising main from the forcing receivers being also provided with a similar self-acting non-return flap valve; so that the only valve to be looked after is the single switch valve for reversing the vacuum and compressed-air pipe to the forcing rams.

In this way the sludge, which is swept from the precipitating tanks, is very expeditiously delivered into the overground sludge store.

By this means the whole of the mechanical work on the sewage works, including the mixing of all the chemicals and the raising of the sludge to the sludge store tank and the pressing of the sludge, is accomplished by means of vacuum or compressed air produced by the oil engine. The transmission of power is of the simplest character, being by simple pipes and valves. There are no machine moving parts; and, as a result, the wear and tear is reduced to a minimum.

At first it might be thought that the loss of power which occurs in compressing air would be serious, but when it is taken into consideration in comparison with the loss that would ordinarily be experienced by transmission through shafting and belting, and the losses by friction inherent in mechanical agitators and pumps, it is found that on the contrary there is a very large saving of power as compared with the older methods of working sewage works. In fact, this

will be self-evident from the statements already made—that a six effective horse-power engine can be worked for twelve hours for less than 2*s.* 6*d.* for fuel.

By having the sewage works arranged in a compact way, so that all of the appliances are easily under supervision, two men will be found sufficient to carry on the work of a sewage works suitable for a population up to 10,000, and three men for populations larger than this. In order to effect this, the most economical arrangement is to have the plant for pressing the sludge large enough for the sludge produced in two days' working to be pressed in one; then the men employed in working the sewage depot work alternately in cleansing out one precipitating tank every alternate day and using the presses for the disposal of the sludge on the alternate day.

The matter of attending to the treatment of the sewage with the chemicals is practically automatic, and the flow of the chemicals and the charging of the mixers only require adjustment at considerable intervals, so that the work can be easily accomplished by a little systematic arrangement of hours. And not only is the amount of machinery reduced, but also the cost of the buildings, on account of their being much smaller and of a simpler character.

The drawing shows a design of a sewage works constructed on the pneumatic system, in which the total cost of machinery, including the motive power, engine, sludge presses, pneumatic mixers, screens, tank valves, floating arms and tanks complete, is between £600 and £700, and this installation would be large enough to deal with a sewage works suitable for a population of 10,000.—*The Surveyor*, *April 4th*, 1895.

TEA.

DID you ever hear of Janet Reid, the Scotch poetess? She flourished somewhere about the middle of this century, says Mr. A. M. Ferguson, of the *Tropical Agriculturist*, and was a sterling character. Her compositions were in the style of ballads, and were evidently appreciated for their motive if not for their merit, for they passed through many editions. The specimen here given is marked in the British Museum "*thirty-second* edition," and is styled

On a Comfortable Cup of Tea.

I wonder how people in drunkenness can delight,
For drunkenness often ends in spite.
A comfortable cup of tea will neither harm you nor me;
Those who only take a cup of tea,
To their neighbors they'll have another to gie.
Round the tea-table there's contentment and peace,
They choose a respectable man to say the grace.
The third command at the tea-table is seldom broke,
With one another they often pass a harmless joke.
But with the drunkard it is not often so,
God's law they often break, and prove one another's foe.
If people would look forward to gray hairs and clothing thin,
They would hang the little gin stoup on a pin,
And slip awa' home with drunken groat,
And think on the time they may need a new coat.
If working people would save threepence a week,
They would sometimes have need for it when they are sick.
Though it is but a halfpenny a day,
Perhaps they would see need when once their hairs grew gray.
To beggary with drink many a one does come,
For in my lifetime I have seen some.
Thomas Boston speaks of an inn by the way,
But people should not very long there stay.
I wish all drunken people the fifth of Galatians to read,
And with sober people begin to take up their head.
And them that do love a good cup of tea,
It is not like whiskey and that you'll see;
These are the proper company for you and me.
Tea-parties meet in friendship and peace,
To young or old they'll never bring disgrace.
All drunkards I hope will take an advice from me,
Give over drinking whiskey and take a cup of tea.
I hope good people God's goodness will not forget,
While round the tea-table they do sit.

The Water of the Ocean contains gold, held in solution by the iodide of calcium. The quantity is about one grain to the ton.

MEDICAL EXCERPT.

By T. P. Corbally, A.M., M.D.

Nutrition in Chronic Phthisis.—M. A. Robin presented a communication to the Société Médicale des Hôpitaux (*Le Progrès Médical*, April 6th), in which he gave the results of his urological researches in regard to nutrition in chronic cases of phthisis.

1. In cases of phthisis in which the disease is stationary, or in the way of improvement, the organic changes, as a whole, seem to be the same as in persons in health.

2. All phthisical persons, in which the average of solid substances eliminated by the urine in twenty-four hours falls below 30 grams, must be considered clinically as approaching the cachectic period.

3. In cases that are not far advanced, having neither fever, diarrhœa, nor severe night sweats, the increase of the solid residue indicates an increased activity, which gives a favorable prognosis.

4. In the same conditions a decrease of the solid residue below 30 grams is also a favorable symptom if the weight of the patient has increased so as to compensate for the diminution of the solid matter in the urine.

5. Cases of hemoptysis are accompanied with a diminution of solid matter in the urine, which persists for several days after the cessation of the hemoptysis.

6. A gradual decrease of the solid matter without a decrease in the weight of the body is an evidence of an increase in the disease.

7. In the later stages of the disease the fever, unless in exceptional cases, is not accompanied with a decrease in the waste of the organism.

8. In the same periods certain inflammatory complications, as milliary eruptions, pneumonia, meningitis, and the like, precipitate the decrease of the proportion of solids in the urine. The sudden lowering of this ratio during the course of the third stage may justly awaken attention in anticipation of a new complication

9. In cases of phthisis treated with cod-liver oil in large doses the diminution of the proportion of solid matter indicates saturation and the necessity of suspending the medicine; an increase of the ratio after the cessation of the medicine, without a decrease in the weight gained during the treatment, gives occasion for a favorable prognosis.

10. The inorganic matter as a whole undergoes variations too extensive to permit the formation of definite indications; however, the ratio of diminution of solids in the organism is always less during the first stage of phthisis; it falls to a minimum in cases that are fatal.

11. The waste of mineral substances in the early stages of phthisis, even before the invasion of the bacilli, leads to the determination of the seat of the tuberculosis, the knowledge of which is of the greatest advantage in a therapeutic as well as in a prophylactic point of view.

PAPINE is highly recommended by Dr. Belcher Hyde, of Brooklyn, N. Y., for its efficiency as an anodyne or hynotic in the disquietude and nervous condition of phthisical patients. He cites a case as follows:

"In August of last year I was called upon by a lady, who had recently lost her husband and only son by consumption, to prescribe for her only daughter, a young lady of eighteen, who was hopelessly ill with the same disease. For the past two or three years she had been gradually failing in health, and during the latter part of her illness she became exceedingly nervous and irritable, due, in a measure, to the loss of sleep. I found that a single dose of a dram given at night only, in hot water, acted very happily, inducing a quiet, refreshing sleep, which lasted generally through the night, and I found it did not act unpleasantly by inducing any tendency to constipation. When I called in the morning she would invariably refer to her pleasant sleep the night before, expressing great relief."

HEMATEMESIS AND ULCERATION OF THE STOMACH.—M. Ferrand (*La France Médicale*, April 12th) presented to the Société Médicale des Hôpitaux specimens obtained from the stomach of a woman, twenty-five years of age, who was re-

ceived into the hospital with the following symptoms, referable to a gastric disturbance accompanied with severe dyspeptic pains. This woman, before her entrance, had hematemesis on several occasions. She was cachectic and feeble. Toward the end of February she had a very severe attack of hematemesis; then later she had distinct symptoms of peritonitis. She was subsequently attacked with parotitis, which swelled to an extraordinary size and made it necessary to transfer her to the surgical ward for operation. She was later attacked with pneumonia and died.

The autopsy led to the discovery that the profuse hematemesis was produced without the presence of any simple ulcer. There were only some slight ulcerations on the mucous membrane, but no trace of any *ulcus simplex*.

GRIPPAL ORIGIN OF RHEUMATISM.—M. Courtade stated to the Société de Thérapeutique (*Le Progrès Médical*, March 16th) that, in regard to the recent communication of M. Weber, he was of the opinion that the cases observed had reference to colds, coryzas, and simple sore throats, not depending on grippal infection. He concluded, from this inference, that it was such cases of colds, coryzas, rheumatismal sore throats that yielded usually to the salicylate of sodæ. He is far from objecting to the use of antiseptic measures as applied to the nose and throat in such cases, but he doubts their usefulness as prophylactic measures against rheumatism.

M. Weber found in the objections of M. Courtade a strong argument in favor of the grippal origin of rheumatism. If the coryza, sore throat, and tracheal inflammations are admitted to be manifestations of rheumatism, it is easy also to admit the hypothesis that the polyarthrisis may depend on the same infection.

THE *Journal d'Hygiène* suggests a simple method of determining whether a cesspool communicates with a well of drinking water. Pour into the cesspool about a pint of fluorescin —eight ounces to one and one half pints of water. In a very short time, if any communication exists, the well water will be colored a deep red.

EDITOR'S TABLE.

SANITARIAN, JUNE NUMBER, 1895.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

FREE PUBLIC BATHS.

THE act which was signed by Governor Morton, April 19th, is as follows :

SECTION 1. Chapter 473 of the laws of 1892, entitled "An act to establish free public baths in cities, villages, and towns," is hereby amended so as to read as follows :

"All cities of the first and second classes shall establish and maintain such number of free public baths as the local Board of Health may determine to be necessary. Each bath shall be kept open not less than fourteen hours for each day, and both hot and cold water shall be provided. The erection and maintenance of river or ocean baths shall not be deemed a compliance with the requirements of this section. Any city, village, or town having less than 50,000 inhabitants may establish and maintain free public baths, and any city, village, or town may loan its credit or may appropriate of its funds for the purpose of establishing such free public baths."

This act shall take effect immediately.

For this salutary act of the Legislature credit is chiefly due to Dr. SIMON BARUCH, of New York, who has for several years urged it, and, meanwhile, been instrumental in introducing the greatly improved system of rain baths in various charitable institutions in the city.

The Baron de Hirsch Fund trustees built a bath-house ; the De Milt Dispensary established bath-rooms, and finally the Riverside Association introduced the baths into its building. The various associations charged five cents a bath, except the De Milt Dispensary, and its managers required ten cents. Thus it was a cheap bath that was secured, the free bath remaining as far away, apparently, as ever.

But now that this free boon to the poor has been secured almost wholly by Dr. Baruch's public spirit and push, it is gratifying to know that the health departments of both New York and Brooklyn, and the boards of aldermen, are actively engaged on measures to render the law effective as speedily as possible.

VACCINATION, QUARANTINE, OR SMALL-POX?—The judicial decision sustaining the act of Health Commisioner Emery, published in our March number, has been reversed. The commissioner's action is declared to be unwarranted interference, because, apparently, there was no evidence of the actual exposure of the expressmen to the disease.

The reasons for the affirmation of the course of Justice Gaynor in dismissing from custody William H. Smith and Thomas Cummings, who were confined in a stable by Health Commissioner Emery because they refused to submit to vaccination, are set forth at length in the opinion of the Court of Appeals which has just come down. The document is written by Justice Gray. In it he says, after reviewing the law: "I find no warrant for the extraordinary declaration of the commissioner that 'wherever any person shall refuse to be vaccinated, such person shall be immediately quarantined and continued in quarantine until he consents to such vaccination.' Of course, if we could regard it as a mere expression of his opinion as to what measures would be necessary to prevent pestilence, this document would not demand our consideration; but, being issued officially and with the formal approval of the Mayor and the President of the medical society of Kings County, as required by the city charter, it assumes the importance of a public and official paper, and the inquiry suggests itself as to the authority for its terms. That the powers conferred upon the Health Commissioner by the provisions of the city charter give to him the right to compel the vaccination of every citizen in the city of Brooklyn, if he would escape quarantine, seems an unnecessary and it is an unwarrantable inference from the language. It is difficult to suppose that the Legislature would invest local officials with such arbitrary authority over their fellow-citizens, and the language of an act would have to be very plain before the court would be warranted in

giving such a construction. But the Legislature has done nothing of the kind. As the respondent has utterly failed to show any facts which warranted the isolation of the relators, they were properly discharged."

AGAINST THE USE OF CURS FOR THE PROMOTION OF SURGERY.—The recent act of the President of the Woman's Branch of the S. P. C. A., in Philadelphia, suggests the transposition and change in the significance of these initial letters, as above written.

Professor W. W. Keen wanted a dog, from which to exsect a nerve for the purpose of grafting it into a gap in the sciatic of a patient in the Jefferson College Hospital. He sent to the city pound for a dog for this purpose, but his request was refused by Mrs. Caroline Earle White, the President of the Woman's Branch of the S. P. C. A., which society, it appears; has charge of the pound. The operation had to be postponed. A correspondence followed between Mrs. White and Dr. Keen, which is published in full in the Philadelphia *Record* of March 14th, of which the following is an abstract:

Mrs. White to Professor Keen:

"In answer to your note, I will say that although I should always approve of sacrificing a dog's life in order to save that of a man, unless the latter was a curse to the world and the former a boon and a blessing (which is sometimes the case), I think that I am justified in refusing to give you one of the dogs at our pound for an experiment which may prove of benefit to one of your patients, or may not, the latter being the most likely alternative."

Professor Keen to Mrs. White:

"Aside from myself there are three parties who are to be considered in this matter. First, the dog; second, the man; and third, mankind.

"First, the dog. I stated to you that the dog would not suffer; that he would be treated with the same care as the man, and that after the operation I should continue the anæsthetic until the dog was dead. Yet you refuse me the dog because, forsooth, somebody else may be cruel to some other dog.

"Secondly, the man. This man knows what I am going to

do, and is anxious to have it done. His leg is paralyzed. If by an ordinary surgical procedure I can re-establish the continuity of the nerve, I may be able to cure his paralysis. In that case I should not have recourse to the dog. If, on the contrary, the gap between the two ends of the nerve is so great that I cannot bring them together, either the man must be condemned to paralysis for life, or some other means must be tried to re-establish the nerve and so restore to him a useful leg. This might be done by the process of nerve grafting.

"Yet you refuse me a dog on the ground that it is an 'experiment.' Granting that it is, it is at the most a perfectly harmless experiment, for it would not be more painful than any ordinary operation; and even if it absolutely fails, it leaves the patient not a whit the worse off. If it succeeds, it will be the greatest possible service to him.

"Thirdly, mankind. The only way in which surgery can make any progress is by testing new methods of treatment which have at least a reasonable possibility of success. Just such persistence and continued trials have encircled the globe with ocean cables. But you assume the *rôle* of a judge, who decides that such a new method of treatment shall not be tested. You, who I presume would admit that you know nothing of surgery, put your judgment against that of one who has spent thirty-five years in the earnest study, active practice and continuous teaching of surgery. You will excuse me if I think you are not a competent judge.

"If you had your way there would be no Pasteur Institutes in any part of the world to save so many lives from hydrophobia; there would be no antitoxin treatment of diphtheria, which already has borne such wonderful results; there would be no inoculation against cholera, which in the hands of Haffkine bids fair to rescue thousands of lives; there would be no cerebral surgery, since you would not allow us to investigate the functions of the brain; there would be little or no antiseptic surgery, the greatest stride forward of this century.

"In your misguided zeal for dogs you are guilty, in my opinion, of cruelty to this man, and cruelty to all mankind, because you thwart scientific progress under the guise of love for animals. You would condemn to the torture and disabili-

ties of accident and disease people who have happily been rescued by the more humane scientists in my profession.

"You will pardon me if I write earnestly. It is because I feel deeply the injury you are trying to inflict upon the human race. Happily, the common sense of the community does not allow you to have your way, as they prefer the devotion of my own profession to the welfare of mankind, to your devotion to dogs in preference to men."

WHENCE FOR HEALTH AND COMFORT?—The exodus abroad by every transatlantic steamer which, at the time of this writing, obtains to an extraordinary degree, suggests some very serious reflections on the possibility, indeed the probability, of many sad disappointments. Both those who are ill and in search of health, who leave the comforts of their homes and the sympathy of their countrymen, in search of improvement abroad, and those who are well and seek to be better, would alike do well to reflect upon their chances of such aggravating conditions in the one case as to forestall improvement, and the increased liability to sickness in the other by encountering accommodations regardless of healthful conditions.

Illness is misfortune enough even under the most favorable conditions. And we should be sorry to add to the misery of any one who, despairing of the long-tried comforts of home surroundings without benefit, seeks relief by change of climate, and, if strong enough, the benefits of travel—both remedies often of almost inestimable value if wisely chosen. But our present purpose is to call to mind what everybody knows but does not always think of, the greatly increased distress of sickness among people who regard the invalid as a stranger, and, above all, if he is an inmate of a modern European hotel at a fashionable "health" resort. Then he is liable to become the subject of extortionate pecuniary profit without regard to other conditions. As thus described by the Paris correspondent of the London *Lancet* (March 16th):

"The first thing the landlord generally does is to order the removal of the sufferer. In addition to this, damages are very commonly claimed to recoup the house for the real or imaginary prejudice caused by the presence of the patient. Now, it need hardly be said that compulsory removal may entail

great danger, nor must it be forgotten that the presence of a case of scarlet-fever has not unfrequently been successfully concealed from the other denizens of the establishment, in which case it is hard to appreciate the loss of credit or custom incurred by Boniface. The right of the landlord to enforce removal and the payment of damages is rarely contested by the victim, who has then nothing to do but submit. Now, the travelling public should know that by a judgment delivered by the Sixth Chamber of the Paris Cour d'Appel on February 1st, 1895—a judgment confirmatory of the ruling of the Civil Tribunal of the Seine, dated June 30th, 1893—the position assumed by the landlord in such a contingency is untenable. In the judgment it is expressly stated that damages cannot be claimed from a visitor for the trouble and possible loss caused by the presence in the hotel of a member of that visitor's family affected with an infectious disease, provided that the medical attendant delivers a certificate to the effect that risk to life would attend removal to another house. The traveller can resist removal even if the landlord has served him with a formal notice to quit at the very onset of the illness. It is held that the illness is an accident beyond the sufferer's control, and that, further, such an unfortunate occurrence forms part and parcel of the obvious risks attending hotel-keeping. It is ruled, however, that the visitor is responsible for the expenses incurred for the cleansing and disinfection of the premises occupied by him."

How to Swindle the Public.—A. M. Ferguson, of the *Tropical Agriculturist*, reports that on a recent research among the collections of single sheets in the British Museum, he quite by chance, came across one entitled "A comical and diverting Dialogue between a farmer, a butcher, a miller, a publican, a tea-dealer, a cheese monger, a milkman, a baker, . . . and their old friend the Devil. London, 1830." The above-mentioned personages have a meeting, with their "old friend" in the chair, at which they all describe the ways in which they swindle the public; of course the milkman has his chalk and water, and the tea-dealer says: "That's right, keep the game alive. I mix beans with coffee, and sloe leaves with tea."

A NEW OFFICIAL under the reform sway hereabout, on entering upon his duties was so disturbed by the loud talking of subordinate employés in adjoining rooms that he determined upon protection. To this end he called for a carpenter from among them to partition off a portion of his office, and enjoined him to make it sound proof. This the carpenter declared he could effectually do by an interspace filled with sawdust. He was ordered to proceed with the work. When it was finished the official stood on one side and called to the carpenter on the other side: "Can you hear me, Patrick?" "No, sir; not a bit," was the prompt reply.

LOFTY WALLS.—The *Sun* recently printed about three columns under the headline, "Inspired by Lofty Walls," having reference to the positively fearful height to which the walls of the new American Surety Building are being carried. The article was illustrated by nine sketches of lookers-on in various attitudes—chiefly turning up their noses, for with no backhanded compliment intended to the American Surety Company, that is what all must do who look at the lofty pile. One or two more buildings like this and Farmer Dunn will have to go up higher than even where he is now, in the Manhattan dome.

NECESSITY OF FREQUENT VISITS.—The Supreme Court of California (Todd *v.* Myers, 40 Cal., 355), in an action brought by a physician for professional services—the defence being that the visits were too frequent and not necessary—rules that "the defendant having admitted the employment of the plaintiff as a physician to treat his wife and children, the plaintiff was the proper judge of the necessity of frequent visits, and in the absence of proof to the contrary, the court will presume that all the professional visits made were deemed necessary and were properly made. It would be a dangerous doctrine for the sick to require a physician to be able to prove the necessity of each visit before he can recover for his services. This is necessarily a matter of judgment, and one concerning which no one save the attending physician can decide. It depends not only upon the condition of the patient, but in some degree upon the course of treatment adopted."

QUARANTINE EXAMINATION BY ELECTRIC LIGHT.—Our new Health Officer, Dr. Doty, has arranged to use electric light when necessary in the examination of passengers on incoming steamers. In this way it will be possible for vessels to pass Quarantine after sundown. The new arrangement will add greatly to the comfort of travellers.

A FLY IN THE BEER.—If a fly drops into a beer glass, says *Fliegende Blaetter*, one who has made a study of national characteristics can easily tell the drinker's nationality by his action.

A Spaniard pays for the beer, leaves it on the table, and goes away without saying a word.

A Frenchman will do the same, except that he swears while he goes.

An Englishman spills the beer and orders another glass.

A German carefully fishes out the fly and finishes drinking his beer as if nothing had happened.

A Russian drinks the beer with the fly.

A Chinaman fishes out the fly, swallows it, and then throws away the beer.

MICROBITES is a well-chosen name by *The Lutheran* for the excited Christians who fear the chalice and use "individual cups" instead. "There is no safety," says *The Lutheran*, "for such a man but in a glass case with a glass stopper; and that he must keep out of, lest he poison the inside with his own microbes."

But the microbites are ever alive to the main chance, if not, indeed, to the main purpose; for another individual communion-service device is announced, and, like the rest, it is protected by letters patent, and therefore prohibited use by other microbites except on the payment of royalty for the promotion of the pecuniary welfare of the reverend inventor. But the accomplished editor of the *Physician and Surgeon* (April number, from which this announcement is taken), after describing the device, points out an important defect which may hurt the sale and materially lessen the profits of the enterprise. "No provision has been made against the *micrococcus viscosus* of the wine, and it is therefore suggested to the scrupulously hygienic communicants that they approach the sacra-

mental offering equipped with a straw containing an improvised sterilizer, through which this elixir of the new dispensation may be imbibed with safety."

WHAT CONSTITUTES A DRINK.—One day, as I drove along a pleasant country road I came to a farm-house, and noticing an old-time wellsweep in the yard, it occurred to me that it would be nice to get a drink there, so I stopped and spoke to a man at the gate.

"Can I get a drink here?" I asked, with a longing look toward the well.

"Sorry, mister," responded the Kentuckian, "but there ain't a drop in the place, and I was gettin' purty dry myself."

"Isn't there any water in the well?" I repeated.

"Oh, yes, of course," he blurted out, as he hustled off for the gourd. "I didn't know you wanted water; I thought you wanted a drink."

BOSTON HOSPITALS RECEIVE BEQUESTS.—The late Moses Kimball, the founder of the Boston Museum, leaves to the New England Hospital for Women and Children the sum of $21,000; $5000 to the Massachusetts Charitable Eye and Ear Infirmary, and a like sum to the Boston Dispensary, as well as to a number of homes and charitable societies.

SANITARY TOPOGRAPHY AND MINERAL SPRINGS.—It was our purpose to resume this subject in this number, but the excellence and timeliness of other articles at hand have deferred it to the next issue.

SANITARY PATENTS OF RECENT DATE.

536,942. Filter. J. G. Sutton, West Newton, Pa. A porous filter-block provided with a reservoir or chamber for the filtered water, and a serpentine channel or passage for the unfiltered water and separate and independent of said reservoir; the ends of the channel being disconnected.

536,621. Manhole-cover. T. P. Greger, Philadelphia, Pa.

536,600. Street-sprinkler. A. Cameron, Chicago, Ill. A nozzle having a transversed discharge opening, of a sleeve arranged for adjustment upon the nozzle, and having a graduated opening for varying the length of the discharge opening.

536,941. Street-sweeper. J. A. Smith, Macomb, Ill. A supporting framework, ground-wheels, brushing and elevating mechanisms, and connections between said brushing and elevating mechanisms and the ground-wheels, of a receptacle supported by the framework, horizontal guides attached respectively to the receptacle and the framework, roll-supporting brackets attached respectively to the framework and the receptacle, with their rolls engaging said horizontal guides, and means for moving the receptacle laterally to discharge its contents.

537,020. Filtering device. J. E. Crawley, Milwaukee, Wis.

537,181. Garbage crematory. B. Boulger, Chicago, Ill. A fuel furnace, of a garbage furnace comprising inclosing walls, a main chamber divided into two compartments by a bridge wall, a pair of grates, one above the other, extending entirely across the first compartment, a pair of grates similarly arranged in the second compartment, the upper of said grates providing draft space at its rearward end and the lower one providing such space at its forward end, the flue from the fuel furnace entering the cremation chamber below the first set of grates, and the discharging flue leaving said chamber below the second set of grates.

537,339. Garbage furnace. A. Brownlee, Dallas, Tex.

537,230. Street-sprinkler. H. C. Pollman, St. Louis, Mo. The sprinkler-casing of a street-sprinkler, provided with a slot which gradually widens from one of its ends to its opposite end.

537,278. Street-sweeper. J. A. Doherty, New York, N. Y.

537,508. Process of making chlorin. Henry W. Wallis, London, Eng. The oxidation of the nitrosyl chlorid by subjecting it to the action of an excess of nitric acid in sulphuric acid.

537,705. Filter. J. McCabe, New Orleans, La. Consisting of two concentric vessels, with filter material placed in the space between the two; a filter bottom to the inner vessel clear of the bottom of the outer vessel; a drain-cock adapted to drain off the liquid from the bottom of the outer vessel, and a spout to drain off the filtered liquid connected to the inner vessel above the bottom thereof.

537,489. Filter. C. L. Sherwood, Faribault, Minn.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

CORRESPONDENTS under this head are requested to be as prompt as possible. *The date of make-up is the tenth of the month preceding the date of issue.*

ALABAMA.—Jerome Cochrane, M.D., State Health Officer, Montgomery.

ARKANSAS.—John I. Hancock, M.D., President, Argentina; D. W. Holman, Secretary, Little Rock.

Little Rock.—A new board of health met and organized April 17th. Mayor Woodson was elected President, and Dr. Milton Vaughan, City Physician, Secretary.

CALIFORNIA.—C. W. Nutting, M.D., President, Etna Mills; J. R. Laine, M.D., Secretary, Sacramento.

Reports from 66 central localities, aggregating a population of 752,823, show a mortality of 1132—an annual death-rate of 18.00 per 1000.

Deaths from consumption, 212; pneumonia, 142; bronchitis, 51; congestion of the lungs, 10; diarrhœal diseases, 14; from other diseases of the stomach and bowels, 55; diphtheria and croup, 8; scarlatina, 3; measles, 4; whooping-cough, 1; typhoid-fever, 14; malarial-fever, 1; cerebro-spinal-fever, 12; cancer, 45; diseases of the heart, 103; alcoholism, 2; from all other causes, 455, 18 of which were from *la grippe* and 1 from leprosy.

San Francisco, 330,000: Deaths, 609; from consumption, 109; acute lung diseases, 134; heart diseases, 50; cancer, 30; diseases of the stomach and bowels other than diarrhœal diseases (6), 31; cerebro-spinal-fever, 8; typhoid-fever, 4. Death-rate, 22.17.

Los Angeles, 75,000: Deaths, 107; from consumption, 28; acute lung diseases, 9; heart diseases, 11; diphtheria, 4. Death-rate, 15.2.

Oakland, 60,000: Deaths, 83; from consumption, 13; acute lung diseases, 18. Death-rate, 16.3. Reorganization of the Board of Health, May 1st (*Call*, San Francisco, May 2d). Mayor Davis appointed Drs. B. W. Rodgers, W. W. Beck-

with, and Sarah D. I. Shuey to fill the offices vacated by Drs. Pinkerton, Pratt, and Foster.

Sacramento, 30,000: Deaths, 49; from consumption, 6; acute lung diseases, 3; typhoid-fever, 3. Death-rate, 19.2.

COLORADO.—A. Stedman, M.D., President, Denver; Henry Sewell, M.D., Secretary, Denver.

CONNECTICUT.—Professor William H. Brewer, Ph.D., New Haven, President; Professor C. A. Lindsley, M.D., Secretary, New Haven.

The mortality report for March has been received from 165 towns in the State. The number of deaths, 1410—53 more than in February, and 244 more than the average number of deaths in March for the five years preceding the present. Deaths under five years, 287. Death-rate for the large towns, 20.2; for the small towns, 22.7, and 20.9 for the whole State. The deaths from zymotic diseases were 145, being 10.2 per cent of the total mortality. Deaths from consumption, 163; acute lung diseases, 330; heart diseases, 122.

New Haven, 100,000: Deaths, 158; under five years, 40. Deaths from consumption, 17; acute lung diseases, 29. Death-rate, 18.96.

Hartford, 62,000: Deaths, 97; under five years, 23. Deaths from consumption, 8; from acute lung diseases, 20. Death-rate, 16.7.

Bridgeport, 58,000: Deaths, 121; under five years, 35. Deaths from consumption, 19; from acute lung diseases, 26. Death-rate, 24.5. At the time of this writing (May 10th) *scarlet-fever* is reported (Hartford *Post*, May 6th) to be prevailing extensively—32 cases during the week ending May 4th.

The Typhoid-Fever Epidemic at Stamford.—Dr. C. A. Lindsley, Secretary of the State Board of Health, said, April 29th (New Haven *Palladium*, April 30th), that the outbreak of typhoid-fever at Stamford is decidedly the worst on record in Connecticut. He gives the result of the Board of Health investigation as follows:

In a population of about 18,000 in Stamford there were up to April 27th 168 cases in which the diagnosis was typhoid-fever, and 24 other cases were doubtful; 54 out of 160 cases were under ten years of age, indicating milk used by children

as the cause; 43 were between twenty and thirty years of age; 147 of the persons affected were consumers of the milk of one dealer; 6 of the remaining 13 took milk from his cans; 1 used his milk supplied to another family, and 6 took milk from other sources. The well from which the water to wash the cans (and probably to dilute the milk with) was taken was found to be filled with surface water, and to be brimming with bacteria.

New Milford, May 8th (*Palladium*, May 9th).—Typhoid-fever has broken out in this town. Up to this evening the full number of cases reported to the Health Officer was 28. There are 3 teachers and 2 pupils ill with typhoid-fever at the "Ingleside" school, a young ladies' seminary conducted by Mrs. Black.

It is supposed that the epidemic was caused by infected milk supplied to the pupils at the seminary from a farm owned by Mrs. Black.

DELAWARE.—E. W. Cooper, M.D., President, Camden; E. B. Frazer, Secretary, Wilmington.

DISTRICT OF COLUMBIA, 250,000: W. C. Woodward, M.D., Health Officer.

Mortality report for the four weeks ending April 27th, 445, of which number 348 were of colored people; 120 were under five years of age. The annual death-rate was 21.38 per 1000. There were 48 deaths from zymotic diseases, and 72 from consumption.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M.D., Secretary, Jacksonville.

The summary, as published in *Florida Health Notes* for the month of February, is as follows:

Number of counties reporting, 45; number of cities reporting, 3; total population of said counties and cities, 391,422; number of deaths reported, 291; death-rate per 1000 per annum, 8.81; deaths under five years of age, 64.

ILLINOIS.—William E. Quine, M.D., President, Chicago; J. W. Scott, Secretary, Springfield.

Small-pox.—At the quarterly meeting of the State Board (April 30th–May 2d) the Secretary reported that there were 105

small-pox centres outside of Illinois during the quarter and 26 centres in the State, with 90 cases and 15 deaths. A resolution was unanimously adopted by the Board, indorsing the administration of Dr. Arthur R. Reynolds, Commissioner of Health of Chicago, in which it is recited that he found "a practically unvaccinated community, requiring within the two years a total of 1,119,320 public vaccinations, more than one half of which were performed within a single month; the hospital facilities were disgracefully and dangerously inadequate; there was no ambulance service, nor corps of trained assistants, nor appropriations to secure any of the essentials necessary to deal with an outbreak of a highly contagious and malignant disease." These difficulties were overcome and the outbreak was suppressed with a mortality of about 60 per cent of the epidemic of 1871–74, of less than 45 per cent of that of 1862–64, and of 26 per cent of the great epidemic of 1880–83. The Board characterizes this wholesale immunization and its results as "an unparalleled achievement of sanitary administration—a triumph of preventive medicine which fitly closes the first century of Jenner's discovery."

Chicago, 1,600,000: A. R. Reynolds, M.D., Commissioner.

Annual report for the year ending December 31st, 1893:

The United States census of 1890 gave Chicago a population of 1,099,850; the school census of 1892 found a population of 1,438,010—an increase of a fraction over 15 per cent per annum for the two years. Adding the increment of the 15 per cent increase to the census figures of 1892 gives Chicago an average population of 1,653,711 living during the year 1893. And this is believed to be a most conservative estimate.

Total number of deaths registered, 27,083—13,664 were under six years of age. Of the deaths of children, 1613 were from cholera infantum, 975 from scarlet-fever, 234 from measles, and 210 from whooping-cough, all more or less preventable. From diseases due largely to faulty or imperfect nutrition there were 1326 deaths from infantile convulsions, 651 from inanition (starvation), and 378 from infantile marasmus or wasting.

Of the causes of death at all ages during the year, the most important from the standpoint of sanitary administration were

the diseases of the respiratory apparatus—pneumonia and bronchitis causing 3710 deaths; the tubercular diseases—consumption causing 2315 deaths; and, from its recent fortuitous prominence, typhoid-fever, which caused 670 deaths in 1893, as against 1489 deaths in 1892 and 1997 deaths in 1891. From diphtheria and croup the number of deaths was 1467; cerebro-spinal-fever, 388; malarial-fever, 83.

Of *small-pox* there were 140 cases, with 23 deaths. The first case discovered was on June 12th. Vaccination was vigorously pushed in the exposed and infected districts, in factories, business houses, schools, and elsewhere, with the result of securing a total of 110,820 vaccinations between June 1st and December 31st.

In proof of the relation between small-pox and vaccination:

Of the total number (140) of cases treated, 42 had been vaccinated, 98 unvaccinated. The 23 fatal cases were all of the unvaccinated. Percentage of deaths of unvaccinated, 23.4. Percentage of recoveries of vaccinated, 100.0.

There were, besides, 3369 deaths from diseases of the digestive apparatus and alimentary canal, a large proportion of which were due to preventable causes.

The death-rate for the year was 16.92—the lowest of any recorded in the city excepting for 1878 (16.50) for over fifty years.

INDIANA.—S. S. Boots, M.D., President, Greenfield; C. N. Metcalf, M.D., Secretary, Indianapolis.

Small-pox was reported (*Sentinel*, Indianapolis, May 7th) at Valparaiso May 6th—1 case and 50 exposures. Considering the large number of normal students which have evidently been exposed, the State office fears that if the case is really one of pronounced small-pox there will be considerable trouble. It is understood that there is the greatest excitement in Valparaiso.

Evansville (*News*).—The new Board of Health organized April 18th, and elected the following officers:

Eleven cases of *typhoid-fever* were reported in the city during the previous week, and the neglect of physicians to report cases was discussed. Another complaint was made against certain physicians who have signed cards stating that certain children have been vaccinated when in fact they have not.

The sanitary condition of the city then received attention, and it was agreed to give the city the usual spring cleaning.

IOWA.—Frederick Becker, M.D., President, Claremont; J. F. Kennedy, M.D., Secretary, Des Moines.

April *Bulletin* reports mortalities for the month of March:

Cedar Rapids, 25,000: Deaths, 19.
Clinton, 22,000: Deaths, 34.
Council Bluffs, 21,000: Deaths, 25.
Creston, 10,000: Deaths, 8.
Davenport, 35,500: Deaths, 38.
Keokuk, 18,000: Deaths, 21.
Oskaloosa, 8000: Deaths, 8.
Dubuque, 40,000: Deaths, 51.
Ottumwa, 17,000: Deaths, 35.
Sioux City, 40,000: Deaths, 31.

No epidemics and no endemics of consequence.

KANSAS.—T. E. Raines, M.D., President, Concordia; T. Kirkpatrick, M.D., Secretary, Westphalia.

Topeka (Kansas City *Times*, April 17th).—There are about 25 cases of *scarlet-fever* in Topeka. All the cases, however, have been quarantined, and there is but little danger that the disease will spread.

KENTUCKY.—Joseph M. Matthews, M.D., President, Louisville; J. N. McCormack, M.D., Secretary, Bowling Green.

Small-pox at Paducah is on the increase, and the situation there is regarded as anything but encouraging. Dr. Long reported yesterday (Bowling Green *Times*, May 8th) to the State Board of Health that there have been 15 new cases within the last few days.

LOUISIANA.—S. R. Oliphant, President, New Orleans; W. R. Harnan, M.D., Secretary, New Orleans.

New Orleans, 275,000—195,000 white, 80,000 colored. There were reported for four weeks ending April 20th, 530 deaths, of which number 229 were among the colored people; and 133 of children under five years of age. Annual death-rate per 1000, white, 22.24; colored, 37.34: 26.56. Deaths from consumption, 65.

MAINE.—C. D. Smith, M.D., President, Portland; A. G. Young, M.D., Secretary, Augusta.

MARYLAND.—John Morris, M.D., President, Baltimore; James A. Steuart, M.D., Secretary, Baltimore.

Baltimore, 496,315—422,568 white, 73,747 colored. James F. McShane, M.D., Health Commissioner.

Deaths reported for the month of March: White, 636; colored, 220: 856. Annual death-rate per 1000: White, 18.04; colored, 35.67: 20.70; 37 died of infectious diseases, 107 of consumption; 276, or 32.24 per cent of the total deaths, were of children under five years of age.

Report for the year 1894: Population, 455,427—white, 384,394; colored, 71,033. Marriages, 4395. Rate per 1000, 9.65. Births reported (exclusive of 721 still-births), white, 8030; colored, 1353. Birth-rates, white, 20.90; colored, 19.05. Deaths, 9486—7242 white, 2244 colored. Death-rates, white, 18.85; colored, 31.60: 20.84. Deaths under five years of age, 3761.

The prevailing causes of death were, from consumption, 1106; pneumonia, 790; cholera infantum, 440; heart diseases, 438; cancer, 264; bright's disease, 226; diphtheria (and croup), 231; typhoid-fever, 222; diarrhœa, 144; influenza, 132; whooping-cough, 112; accidents, 109; bronchitis, 90; scarlatina, 85; dysentery, 72; typho-malarial-fever, 35; cerebro-spinal-fever, 26.

MASSACHUSETTS.—H. P. Walcott, M.D., Chairman, Cambridge; S. W. Abbott, M.D., Secretary, Boston.

Boston, 501,107: S. H. Durgin, M.D., Chairman, reports for the month of March, 1007 deaths, of which 280 were under 5 years of age. The annual death-rate was 24.11 per 1000. From zymotic diseases (119), including tubercular diseases, 315. Deaths from diphtheria and croup, 34; from scarlatina, 14. Of these and other zymotic diseases the number of cases reported during the month were: Diphtheria, 205; measles, 437; scarlatina, 184; typhoid-fever, 19.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M.D., Secretary, Lansing.

The Secretary reports that for the month of April, compared with the preceding month, inflammation of bowels and

erysipelas increased, and whooping-cough decreased in area of prevalence.

Compared with the average for corresponding months in the nine years 1886–94, influenza was more prevalent, and measles, intermittent-fever and remittent-fever were less prevalent in April, 1895.

Including reports by regular observers and others, consumption was reported present in Michigan during the month of April, 1895, at one hundred and fifty places (probably only a very small proportion of the cases of consumption are yet reported); scarlet-fever at sixty-seven places; diphtheria at forty-five places; measles at thirty-three places; typhoid-fever at twenty-four places, and small-pox at four places.

Reports from all sources show diphtheria reported at nine places less; scarlet-fever at seven places less; measles at six places more, and small-pox at two places less in the month of April, 1895, than in the preceding month; typhoid-fever was reported at the same number of places in the months of March and April, 1895.

Detroit.—The new Board of Health. Governor Rich has appointed Dr. Howard W. Longyear, Dr. Oscar LeSeure, Mr. E. C. Van Husan, and Mr. H. P. Davock, Health Commissioners of the city of Detroit. Dr. Longyear has been appointed for four years. He is a graduate of the College of Physicians and Surgeons of New York City, and is a physician of prominence. Dr. LeSeure's tenure of office is for three years. He received his medical degree at the Homœopathic Medical College of the University of Michigan, and afterward graduated from Bellevue Hospital Medical College. He has achieved prominence as a homœopathic physician. Mr. Van Husan will serve on the commission two years. He is a business man of hustling propensities. Mr. Davock is the one-year incumbent, and in consequence has been honored with the presidency of the board. He is a well-known attorney. The commission have appointed Dr. Samuel P. Duffield Health Officer. All of which appointments, says the *Physician and Surgeon*, are particularly satisfactory to the citizens of Detroit.

But not being so to the Mayor, he appealed to the Supreme Court, challenging the constitutionality of the law. The

court holds that the law does not interfere with local self-government, as the sanitary condition of Detroit is a matter of importance to the whole State. The comptroller is ordered to pay over the $12,000 he has heretofore refused to put into the hands of the Health Board. Mr. Pingree and the recalcitrant comptroller have been beaten at every point.

The Board is evidently well equipped, personally at least, for effective work, though it is apparently slow in showing it.

MINNESOTA.—Franklin Staples, M.D., President, Winona; C. N. Hewitt, M.D., Secretary, Red Wing.

Vital Statistics for the years 1892–93, Fourth Biennial Report, with a Comparative Study of the Leading Causes of Mortality in Minnesota for the Quintennial Period 1887–93. A pamphlet of 151 pages, almost wholly of tabulated statistics, but so worked out as to convey suggestions of great practical utility. Thirty-nine thousand three hundred and sixty-six cases of death are classified and tabulated. The average mortality for seven years (1887–93) of the diseases selected and tabulated for present study are as follows:

Diphtheria, 5.16 per cent of all deaths, and 10.8 in 100,000 population.

Measles, .97 per cent of all deaths, and 10.8 in 100,000 population.

Scarlatina, 1.56 per cent of all deaths, and 17.4 in 100,000 population.

Typhoid-fever, 3.80 per cent of all deaths, and 42.5 in 100,000 population.

Tubercular diseases, 9.17 per cent of all deaths, and 109.4 in 100,000 population.

Bronchitis, 2.26 per cent of all deaths, and 66.4 in 100,000 population.

Pneumonia, 5.95 per cent of all deaths, and 66.4 in 100,000 population.

Diphtheria has been more carefully worked out than any other of this class of diseases because of its persistent fatality. Its steady and marked decline in mortality is the most striking and hopeful result of the work of the public health service.

The populations, death-rates per 1000 living, and total deaths are given for the counties and centres severally for each month in the year for the seven years 1887–93.

Total deaths, 101,683: 1887, 13,010; 1888, 15,018; 1889, 14,807; 1890, 14,492; 1891, 14,714; 1892, 14,673; 1893, 14,969. Average, 14,526; average death-rate, 11.15.

Minneapolis, 223,700: H. N. Avery, M.D., Commissioner, reports for March 203 deaths—81 under five years of age. Annual death-rate per 1000, 9.57. From zymotic diseases there were 16 deaths, and from tubercular diseases, 29.

St. Paul, 155,000: Alexander J. Stone, M.D., Commissioner, reports for March 166 deaths—49 under five years of age. Annual death-rate per 1000 was 12.29. Deaths from zymotic diseases, 10, and from tubercular diseases, 23.

MISSISSIPPI.—W. F. Hyer, M.D., President, Meriden; Wirt Johnson, M.D., Secretary, Jackson.

MISSOURI.—F. J. Lutz, M.D., President, St. Louis; Willis P. King, M.D., Secretary, St. Louis.

St. Louis, 540,000: George Homan, M.D., Commissioner of Health.

Report for the month of March: Deaths, 804; under five years of age, 244; from zymotic diseases, 121—39 from diphtheria and croup; from phthisis and tuberculosis, 92. Annual death-rate per 1000, 17.8.

Kansas City, 124,000: R. P. Waring, M.D., Health Officer. Deaths for March, 154; under five years of age, 45. Annual death-rate per 1000 was 12.32.

NEBRASKA.—J. V. Beghtol, M.D., President, Friend; F. D. Haldeman, M.D., Secretary, Ord.

Omaha (1890), 140,452: John J. Saville, M.D., Health Commissioner, reports for March: Total number of deaths, 124; under five years, 42; annual death-rate, 10.6.

Communicable diseases reported: Scarlet-fever, 42—5 deaths; diphtheria and croup, 13—5 deaths. Deaths from consumption, 17.

Annual Report for the year ending December 31st, 1894:

Births (exclusive of 37 still-births), 1898. Deaths, 1149—from diarrhœal diseases, 129; tuberculosis, 111; diphtheria and croup, 56; enteric-fever, 40; scarlatina, 28; measles, 20; puerperal-fever, 6. Death-rate, 8.60. The plumbing, meat, and milk inspectors and the sanitary inspectors of nuisances

and lodging-houses show excellent work, promotive of the low death-rate.

Annual Report of the City Engineer, December 31st, 1894.—Nearly 300,000 cubic yards of public grading has been done at an average cost of about 11 cents per yard. Total paved area of Omaha, as shown by table exhibit, 1,876,770 square yards, and a mileage of 78.12 miles upon the streets and alleys within the city. About one half is of Colorado sand stone, the rest of Sioux Falls (quartzite) brick and macadam.

The sewer construction for the year embraced 13,978 lineal feet, or about 2.65 miles, at a total cost of $21,329.43. At present the total extent of sewers in the city, exclusive of private sewers, is 114.77 miles, which cost $1,706,000. In this system there are no dead ends; every branch terminates with an automatic flush tank. There are no traps either in the sewer inlets or house connections, but the whole system is thoroughly ventilated. Water-works are in controversy. Under contract with the City Water Works Company in 1880 for provision to supply not less than 5,000,000 every twenty-four hours and to furnish adequate fire protection through the medium of hydrants, when the population was but 30,000, with an incorporated area of only eight and one half square miles, it is no wonder that the change in the conditions of the city since that time should, as now appears, involve the necessity of a corresponding change in the requirements. And upon this necessity the controversy is on the question of ownership—whether it would not be better for the city to own the water works than longer to depend upon a company ownership and operation to keep apace with the growing necessities.

NEVADA.—S. L. Lee, M.D., President, Carson City; J. A. Lewis, M.D., Secretary, Reno.

NEW HAMPSHIRE.—G. P. Conn, M.D., President, Concord; Irving A. Watson, M.D., Secretary, Concord.

Small-pox.—The Secretary reports (May 3d) that on April 20th this Board was notified by telegram of the discovery of a case of small-pox in Newport. Since that time several more cases have appeared—7 in the town of Croydon and 11 in the town of Claremont. Vigorous action has been

taken by the local authorities in conjunction with this Board. There seems to be, at the present time, no danger of the disease extending in the town of Newport or Croydon; but there may develop more cases in the town of Claremont. In the latter town the disease is confined entirely to the French population and to four houses. All the infected places are under strict quarantine. A hospital is being prepared about a mile from the village of Claremont, to which all the cases will be removed in a day or two. A careful daily inspection is being made among the class who have been exposed, and every means taken to check effectually the spread of the disease.

NEW JERSEY.—C. F. Brackett, M.D., President, Princeton; Henry Mitchell, M.D., Secretary, Asbury Park.

Bulletin No. 3 for April, summarizes recent legislation and formulates the practical deductions therefrom in the sanitation of school-houses and prisons, and sanitary inspection generally.

Hudson County.—Jersey City and vicinity, 318,746: Report for the month of March: Deaths, 614; under five years of age, 378; from zymotic diseases, 84, of which 20 were from typhoid-fever, 11 from scarlatina, 8 from diphtheria, and 7 from malarial fevers; from consumption, 64; acute pulmonary diseases, 128. Annual death-rate per 1000, 27.4.

Newark, 200,000: Charles Lehlbach, M.D., Medical Health Officer, reports for the month of October, 1894: Total mortality, 348; under five years of age, 119; from zymotic diseases, 98, of which there were from diphtheria and croup, 47; scarlatina, 106; typhoid-fever, 21; small-pox, 12. From consumption, 40; other lung diseases, 33. Annual death-rate per 1000, 20.88.

NEW MEXICO.—Dr. W. R. Tipton, Las Vegas, President; Dr. F. H. Atkins, Las Vegas, Secretary.

NEW YORK.—F. O. Donohue, M.D., President, Syracuse; J. S. Barnes, M.D., Secretary, Albany.

For March the State Board *Bulletin* reports the average daily mortality for the month 367, the estimated death-rate per 1000 population annually being 20.00; this is less than that of February, the daily deaths of which month was 384

and the annual mortality per 1000 population 21.55. Compared with March, 1894, there were 1180 more deaths, and the death-rate then was 18.50. The epidemic of *grippe* which commenced in January has continued through March, showing itself in the increased mortality from acute respiratory diseases, the reported deaths from which were 2395 as well as all other local diseases, and also in the mortality among the aged, which was unusually large, the total increase over the mortality from these causes over March, 1894, being 1300; at the same time the deaths from communicable diseases are less by 300—it may be estimated that there were 1500 deaths from epidemic influenza (*grippe*) during the month, and a total for the present epidemic during the three months of 4500. From common zymotic diseases, although their total mortality is much less than a year ago, there was an increase over the month preceding of 200 deaths, showing itself in diphtheria, diarrhœal diseases, scarlet-fever and measles; there was also a slight (customary) increase in cerebro-spinal meningitis. Diphtheria caused 50 more deaths than in February and 100 less than in March, 1894; the increase was confined to the maritime district. The same is true of scarlet-fever, from which there were only 26 deaths of the 131 outside of that district. Measles also, from which there were 100 deaths, of which all but 15 occurred in the metropolis, caused double the mortality of February. Whooping-cough and typhoid-fever show no change; there were about 100 deaths in the State from typhoid-fever, which is rather below the average for this month, nearly half of these being reported from the Hudson Valley district. Small-pox, for the first time since November, 1891, caused no deaths during the month; in March, 1894, there were 47 deaths from it. Consumption caused 1274 deaths, which is not above the average for this month, although it has been somewhat increased by the prevailing *grippe* epidemic. The weather during the month was generally fair, with small rainfall and low temperature, the prevailing wind being westerly.

At a meeting of the State Board, April 26th, on the request of Health Commissioner EMERY, of Brooklyn, two State Board inspectors were appointed to aid his force in smelling the Newtown Creek and Long Island City nuisances which

still obtain, notwithstanding Brooklyn's responsibility for them and Governor Morton's proclamation *two months ago* for their abatement within *ten days.* Dr. Emery said that the sanitary interests of the city required the appointment of inspectors invested with the ample powers which such State officers would hold. The city would pay the salaries of such inspectors, who, unlike the local ones, could act at Newtown Creek and Long Island City as well as in Brooklyn, especially in the inspection of slaughter-houses and milk.

New York, 1,995,000 : Total deaths, 3895—1471 under five years. Death-rate, 23.00. Zymotic diseases per 1000 deaths from all causes, 125.85 ; 90 from croup and diphtheria. Deaths from consumption, 502.

Brooklyn, 1,086,000 : Total deaths, 1834—644 under five years. Death-rate, 20.00. Zymotic diseases per 1000 deaths from all causes, 119.00 ; 134 from croup and diphtheria. Deaths from consumption, 204.

Syracuse, 95,000 : Total deaths, 142—33 under five years of age. Death-rate, 18.00. Zymotic diseases per 1000 deaths from all causes, 84.50 ; croup and diphtheria, 4. From consumption, 20.

Albany, 100,000 : Total deaths, 231—56 under five years. Death-rate, 27.20. Zymotic diseases per 1000 deaths from all causes, 195.00 ; croup and diphtheria, 2. From typhoid-fever, 26 ; from consumption, 27.

Buffalo, 300,000 : Total deaths, 416—151 under five years. Death-rate, 16.35. Zymotic diseases per 1000 deaths from all causes, 115.38 ; from diphtheria and croup, 22. From consumption, 36.

Rochester, 150,000 : Total deaths, 210—54 under five years. Death-rate, 16.80. Zymotic diseases per 1000 deaths from all causes, 80 ; croup and diphtheria, 9. From consumption, 30.

NORTH CAROLINA.—H. T. Bahnson, M.D., President, Salem ; Richard H. Lewis, M.D., Secretary, Raleigh.

Bulletin for March : Twenty-nine towns, aggregating 125,104 population—77,675 white, 47,499 colored. Deaths, 70 white, 65 colored. Under five years of age, 25.

The annual death rates were 10.8 per 1000 for the white population, 16.4 for the colored : 12.8 for the total. From consumption, 12 white, 15 colored.

Asheville, 12,000 : Total deaths, 13 white, 2 colored.
Charlotte, 14,000 : Total deaths, 8 white, 3 colored.
Raleigh, 15,000 : Total deaths, 13 white, 15 colored.

NORTH DAKOTA.—Hon. W. H. Standish, President, Bismarck ; F. H. DeVaux, M.D., Superintendent, Valley City.

OHIO.—Byron Stanton, M.D., President, Cincinnati ; C. O. Probst, M.D., Secretary, Columbus.

Toledo, 120,000 : Joseph T. Woods, M.D., Health Officer, reports for the month of April : Deaths, 111, of children under five years of age, 17. From zymotic diseases, 14 ; from measles, 6 ; cerebro-spinal meningitis, *grippe*, and typhoid-fever, each 3. From consumption, 14. Annual death-rate per 1000, 11.10.

Cleveland.—"*Small-pox* is steadily increasing," says the *Plain Dealer* of May 3d, "with 11 cases of varioloid and small-pox to look after. Health Officer Hess has found plenty to occupy him since he assumed the duties of that office, and he is meeting the emergency in a manner that augurs well for the health of the city."

Health Officer Hess, in discussing the situation last evening, said : "It is evident that the disease has secured something of a foothold in this particular part of the city, and we propose to do all in our power to prevent its spread."

OKLAHOMA TERRITORY.—L. L. Parker, President, Kingfisher ; C. D. Arnold, M.D., Secretary, El Reno.

OREGON.—*Diphtheria* is reported (*E. Oregonian*, March 19th) prevalent at *Athena*.

PENNSYLVANIA.—S. T. Davis, M.D., President, Lancaster ; Benjamin Lee, M.D., Secretary, Philadelphia.

Philadelphia, 1,163,864 : M. Veale, Health Officer, reports : In the four weeks ending April 27th, deaths, 1884—536 under five years of age. Annual death-rate, 21.07 per 1000. Deaths from typhoid-fever, 40 ; diphtheria and croup, 94 ; from consumption, 198.

Pittsburgh, 272,000 : J. Guy McCandless, M.D., Registrar, reports for four weeks ending April 27th : Deaths, 359—126 under five years of age. Deaths from zymotic diseases, 36—

14 from typhoid-fever; from consumption, 29. Annual death-rate, 16.97.

RHODE ISLAND.—A. G. Sprague, M.D., President, River Point; Gardner T. Swarts, Secretary, Providence.

Bulletin, for January, February, and March summarizes the health of the State for December, 1894: There were 519 deaths—37 more than for the previous month, 102 less than the corresponding month in 1893, and 80 less than the monthly average for 1894. The greater number of deaths were caused by diseases of the respiratory system. Of this number 50 were from pneumonia—9.78 per cent of all. From bronchitis there were but 14 deaths. From diseases connected with the heart and appendages there were 40 deaths, or 7.82 per cent of all. From tubercular diseases, 67. Of these, 59 were from pulmonary tuberculosis—11.54 per cent of all. Of the infectious diseases there were 19 deaths from diphtheria, 6 from scarlet-fever, 6 from typhoid-fever, and 5 from whooping-cough. There occurred 28 deaths from apoplexy and 22 deaths from diseases of the kidneys.

Contagions during 1894: Of 392 cases of diphtheria there were but 115 deaths, or 29.31 per cent. The most of these cases were in the cities of Providence and Pawtucket and the town of Lincoln. There were also a large number of cases in Newport, Cranston, Johnston, and Richmond.

The number of deaths from scarlet-fever was 114 out of 1394 reported, or 8.17 per cent of all. There were 749 cases reported in Providence, or 53.73 per cent of all, with 56 deaths; 241 cases in Lincoln, with 14 deaths; 54 in Newport, with only 1 death.

Of typhoid-fever there were 492 cases reported with 41 deaths. Of these, 258 cases, or over one half, reported from Providence, with 22 deaths.

Sixteenth Annual Report for the year ending December 31st, 1893, and including Report on Vital Statistics for the year. 1892. Pp. 192, 271.

Vital statistics for 1892: Births, exclusive of 371 still-births, 9270—156 less than during the preceding year. Marriages, 3502—182 more than during the preceding year. Divorces, 296—1 to every 11.8 marriages. The number of applications for divorce was 412—1 to every 8.5 marriages. Deaths regis-

tered during the year, 7396—an increase of 776 over the preceding year, and 462 more than in 1890. Death-rate for the year, 20.1—1.5 larger than that of the preceding year; 35.3 per cent were of infants and children under five years of age.

Of the colored population, in every 1000 there were: Births, 24.6; marriages, 25.9; deaths, 31.9.

Of the causes of death, the number from consumption was 740—19 more than in previous year; pneumonia, 568—87 more than in previous year; cholera infantum, 633—87 more than in previous year; heart diseases, 506—an increase of 26 over previous year; typhoid-fever, 133—15 less than in previous year; diphtheria and croup, 178—35 more than in previous year; and from old age, 256—an increase of 71 over previous year. But it is remarked: "There has been a gradual increase during the last thirty years in the average length of life of decedents, taking periods of five years each and a last period of three years, running from about twenty-nine and three fourths years at the beginning, to thirty-four and one seventh years at the ending in 1892."

General results of the registry for 1893: Births, 10,048; birth-rate per 1000 population, 26.5. Marriages, 3544; persons married per 1000 population, 18.7. Deaths, 7440; death-rate per 1000 population, 19.6. Of the leading causes of death, the percentage from pneumonia was 10.43; consumption, 9.70; cholera infantum, 8.10. "Filtration of Public Water Supplies and Disposal of Garbage," by Charles V. Chapin, M.D., Superintendent of Health, Providence, reports of the proceedings of the National Conference of the State Boards of Health, in New York, 1893; and on "Examinations of Ice Supplies and Wall Papers and Wrapping Papers for Arsenic," by the Secretary, are appended.

SOUTH CAROLINA.—J. R. Bratton, M.D., Chairman, Yorkville; H. D. Fraser, M.D., Secretary, Charleston.

Charleston, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M.D., Health Officer, reports for four weeks ending April 27th: Deaths, 114—90 colored. Under five years, 39; deaths from consumption, 16. Annual death-rates, white, 15.31; colored, 32.19: 23.75 per 1000.

SOUTH DAKOTA.—C. B. Alford, M.D., President, Huron.

TENNESSEE.—J. D. Plunkett, M.D., President, Nashville; J. Berrien Lindsley, M.D., Secretary, Nashville.

Bulletin of April 20th reports that at the quarterly meeting of the State Board, April 9th, the term of membership in the Board of Dr. J. D. Plunkett having expired, on motion of Dr. Sims, the Secretary was directed to cast the ballot of the Board for Dr. J. D. Plunkett as the Board's nominee for membership for the term ending April 1st, 1900. The Secretary was directed to inform Governor Turney of this nomination, and the Governor at once confirmed cordially the appointment.

The annual election of officers of the Board was then entered upon.

On motion of Mr. Cole the Secretary was directed to cast the ballot of the Board for Dr. J. D. Plunkett as President of the Board for the ensuing year, making his seventeenth term.

On motion of Dr. Sims, the Secretary was directed to cast the ballot of the Board for Dr. J. M. Safford as Vice-President for the ensuing year.

The principal diseases, named in the order of their greater prevalence, in the State for the month of March were, lung diseases acute, *la grippe*, measles, consumption, malarial-fever, typhoid-fever, chicken-pox, scarlet-fever, whooping-cough, mumps, diphtheria, small-pox, and cerebro-spinal meningitis.

Clarksville, 10,000—white, 6000; colored, 4000. Deaths in March: 3 white, 6 colored. Death-rates per 1000 population respectively, 6.00; 18.18: 10.80.

Memphis, 55,923—white, 28,064; colored, 27,859. Deaths in March: White, 54; colored, 71. Death-rates per 1000 respectively, 23.09; 30.59: 26.81.

Murfreesborough, 5000—white, 3000; colored, 2000. Deaths in March: White, 2; colored, 3. Death-rates per 1000 respectively, 8.00; 18.00: 12.00.

Nashville, 87,754—white, 54,595; colored, 33,159. Deaths in March: White, 95; colored, 104. Death-rates per 1000 respectively, 20.88; 37.63: 27.20.

TEXAS.—R. M. Swearingen, M.D., State Health Officer, Austin.

UTAH TERRITORY.

Salt Lake City, W. T. Dalby, M.D., Health Commissioner,

reports for March, 68 deaths; under five years of age, 10. Annual death-rate per 1000, 11.64. From zymotic diseases there were 11 deaths, of which measles caused 6.

VERMONT.—C. S. Caverly, M.D., President, Rutland; J. H. Hamilton, M.D., Secretary, Ritchford.

VIRGINIA.—R. W. Martin, M.D., President, Chatham; A. Irving, M.D., Secretary, Richmond.

WASHINGTON.—J. R. Hathaway, M.D., President, Everett; G. S. Armstrong, M.D., Secretary, Olympia.

Third Annual Report for the year ending September 30th, 1894.—The collection of vital statistics in this State is to a large extent voluntary. Legislation is urged to make the service more effective. Births returned for the year, 3723, as against 3201 in 1893; 1278 deaths were reported in 1893 and 1673 in 1894. This is considered, under the circumstances, very gratifying. During 1894 no deaths have been reported from small-pox or measles, and only 7 from scarlet-fever. Typhoid-fever caused 52 deaths and diphtheria (including membranous croup), 21. From consumption, 195—about the average proportion throughout the United States. From accidents, 194, giving the remarkably large proportion of almost 12 per cent of all deaths. If to these deaths we add, homicide 7 and suicide 45, it gives us a total of 246 deaths from violence—a little over 15 per cent of all "known" causes of death. The highest proportion the Secretary has found in any other State was 4 per cent. Seventeen were caused by railroad accidents, 36 were asphyxiated in a mine, 58 drowned, and 54 returned simply as accident without stating the precise nature of it.

WEST VIRGINIA.—W. P. Ewing, M.D., President, Charleston; N. D. Baker, Secretary, Martinsburg.

WISCONSIN.—J. W. Hancock, M.D., President, Ellsworth; U. O. B. Wingate, M.D., Secretary, Milwaukee.

Milwaukee, 275,000: W. Kempster, M.D., Commissioner, reports for March: Deaths, 406—under five years of age, 188.

Deaths from diphtheria and croup, 21; typhoid-fever, 5; small-pox, 7; whooping-cough, 9; consumption, 26. Death-rate per 1000, 17.71.

PROVINCIAL BOARD OF HEALTH OF ONTARIO.—John Duff Macdonald, M.D., Chairman, Hamilton; Peter H. Bryce, M.D., Secretary, Toronto.

Report of the Committee on Epidemics for the province of Ontario for the quarter ending March 31st. There is now not a case of small-pox in the province, against 6 cases three months ago, 3 of them being in the Royal Agricultural College. The outbreak resembled those in Yale University and in Storr Agricultural College, Connecticut. In December there were 40 cases of diphtheria; January, 57; February, 40; March, 38. For ten years scarlatina was in abeyance, but in 1892 the mortality was 90; in 1893 it was 146, while last year there was a notable increase. The cities alone had 116 deaths from this cause and 307 from diphtheria. During the year there were 20 outbreaks of small-pox, which cost, in 1 case for suppression, $1600. The Public Health Act of 1895 is now in force. It provides for local boards of health in each township and incorporated village, town, and city. It is their duty to analyze water supplies, to report on sewage systems, and to deal with the public food supply. A report was presented of an outbreak of rabies in Ekfrid township, with the clinical and bacteriological observations thereon.

BUENOS AYRES, 605,792: Albert B. Martinez, Director-General of Municipal Statistics.

Deaths reported during the month of March, 1328; under five years, 621. From epidemic diseases, 159—from cholera, 45; diphtheria and croup, 32; typhoid-fever, 29; scarlatina, 25; small-pox, 10. From consumption, 93. Annual death-rate per 1000, 28.57.

AVERAGE DURATION OF LIFE AMONG PHYSICIANS.—A curious statistical record has been compiled by Dr. Salzmann, of Essling, Würtemberg, on the average duration of life among physicians. He found, in going over the ancient records of the kingdom, that, in the sixteenth century, the average duration of life among that class was but 36.5 years; in the seventeenth century, 45.8; in the eighteenth, 49.8; and at the present time they reach the favorable average of 56.7. It appears from the foot-notes to the above that this very great increase in longevity is due to the disappearance of the "black

pest," the introduction of vaccination, and the great diminution in the number of typhus epidemics, three classes of diseases formerly the especial scourges of medical practitioners.

OBITUARY.

DR. JOHN W. BYRON, the distinguished bacteriologist, died in New York, May 8th, of pulmonary tuberculosis contracted during his investigations of that disease in laboratory work. He was born in Lima, Peru, July 24th, 1861, and was taken away during his most active period of usefulness. With a bent toward bacteriological work, he became identified with it almost from the commencement of a brilliant career. Shortly after his graduation he removed to Havana, and during a yellow-fever epidemic there he made laborious bacteriological researches, which eventuated in the establishment of certain principles of propagation of the disease which proved to be of the greatest practical utility in staying the progress and mitigating the effects of the direful scourge. After a course of laboratory study in Berlin and Paris he was invited five years ago to accept the position of bacteriologist to the Loomis Laboratory, in which position, while experimenting with tubercle bacilli, he is said to have developed the symptoms of his fatal malady.

When cholera appeared in New York in 1894, by invitation of Health Officer Jenkins, he assumed charge of the cholera camp at Swinburne Island, where he remained quarantined during all the period of the threatened invasion. With an earnestness of purpose in his work usual with him, he devoted his best work to the interest of the public safety, and as a reward gained for himself the enviable reputation of a public benefactor. The disease of which he died first showed itself in March, 1894, and made very rapid progress, in spite of his determination to fight against it and continue his investigations. Change of climate was of no avail, and bravely hoping against hope, he died, regretted and mourned by the entire community, a sacrifice to science and an ornament to the profession he so ardently loved.

NEW BOOKS AND BOOK REVIEWS.

ANY BOOK reviewed or advertised in THE SANITARIAN costing $1.50 or less will be sent *free* to any present subscriber sending the name of a new subscriber, or to any new subscriber on receipt of the full subscription price sent on his own account; or any book so reviewed or advertised costing more than $1.50 will be sent at a discount of that amount.

THOUGHTS ON RELIGION. By the late GEORGE JOHN ROMANES, M.A., LL.D., F.R.S. Edited by CHARLES GORE, M.A., Canon of Westminster. Price, $1.25. Chicago: The Open Court Publishing Company.

When this writer had read "Darwin and After Darwin" two years ago,* the query rose to his mind—What? This book is a philosophical response by the same author, but from a view of the other side of the shield. The following extracts from the editor's preface and concluding note so well account for and describe the book, that they are substituted for review:

"The late Mr. George John Romanes, the author within the last few years of 'Darwin and After Darwin' and of the 'Examination of Weismanism,' occupied a distinguished place in contemporary biology. But his mind was also continuously and increasingly active on the problems of metaphysics and theology. And at his death, in the early summer of this year (1894), he left among his papers some notes, made mostly in the previous winter, for a work which he was intending to write on the fundamental questions of religion. He had desired that these notes should be given to me, and that I should do with them as I thought best. His literary executors accordingly handed them over to me, in company with some unpublished essays, two of which form the first part of the present volume. . . . Both essays and notes represent the same tendency of a mind from a position of unbelief in the Christian revelation toward one of a belief in it."

* Reviewed, Vol. XXIX., p. 469.

"The intellectual attitude toward Christianity expressed in these notes may be described as (1) 'pure agnosticism' in the region of scientific 'reason,' coupled with (2) a vivid recognition of the spiritual necessity of faith and the legitimacy and value of its intuitions; (3) a perception of the positive strength of the historical and spiritual evidences of Christianity.

"George Romanes came to recognize, as in these written notes so also in conversation, that it was 'reasonable to be a Christian believer' before the activity or habit of faith had been recovered. His life was cut short very soon after this point was reached; but it will surprise no one to learn that the writer of these 'Thoughts' returned before his death to that full, deliberate communion with the Church of Jesus Christ which he had for so many years been conscientiously compelled to forego. In his case, the 'pure in heart' was, after a long period of darkness, allowed, in a measure before his death, to 'see God.'"

REPORT OF THE COMMISSIONER OF EDUCATION FOR THE YEAR ENDING JUNE 30TH, 1892. 2 vols., pp. 1294. Washington: Government Print.

The number of pupils in school of all grades and conditions, public and private, is 14,714,933, or 22.69 per cent of the population. Evening schools, schools of art and industry, business colleges, schools for defective classes and Indian schools, aggregate more than 300,000 additional, making in all upward of 15,000,000 pupils. The average annual increase of the school enrollment for the six years next preceding has been 249,260—about the same ratio as the increase in population.

Public and private schools.—Out of every 100 pupils in the first eight years of school work, 91.54 pupils are in public schools and 8.46 in private schools. But in ninth to twelfth years' work, the proportion in private schools is 38.41 per cent, and in higher education 64.61 per cent in private institutions, with 35.39 per cent in State universities and normal schools. The private schools enroll nearly one sixth of the pupils in the North Atlantic division of States, but only one fourteenth of the pupils in the Southern and Western States, and less than one tenth of all the pupils in the nation.

The total amount of schooling per citizen, counting 200 days to the school year, is, for the

Whole country	4.30	years.
North Atlantic division	5.89	"
South Atlantic "	2.52	"
South Central "	2.56	"
North Central "	5.15	"
Western "	4.40	"

Physical education is considered in an elaborate article, prepared by Miss Frances Graham French, specialist in the school systems of Northern and Eastern Europe, which closes with suggestions regarding school gymnasiums, and tabular views showing the statistics of physical training in the city schools of the United States. The commissioner prefatorially wisely remarks on this subject, that " he is not convinced that the present theory of physical education, as taught in the schools, gives enough weight to the bodily conditions that favor the restoration of nervous energy.

" It is well known that physical exercise affects directly the muscular system, and that the muscular system is not all of the body, nor, indeed, itself directly the generator of what I have called nervous energy. There is a nutritive process of digestion and a distributive process of circulation through the heart and lungs and liver, the two forming a building-up function which restores, repairs, and increases the organism and removes the waste. There is, besides, a nervous organism which receives impressions from without and sends out impulses that react on the environment.

" Physical training, as we understand it, deals directly and chiefly with the muscular system and with that part of the nervous system which conveys impulses from the brain outward through the limbs to the environment. Physical exercise indirectly acts on the digestion and the circulatory system and on the nerves of sensation, and its relation to those other bodily functions is nearly or quite as important as the direct relation of exercise to the muscles and the acquiring of strength."

Besides comprehending education in all its phases, as conducted in the United States, education abroad is so summa-

rized as to admit of deductions of practical utility to all progressive educators, to whom it affords us pleasure to commend the report as a mine of educational knowledge.

HISTORY OF HIGHER EDUCATION IN RHODE ISLAND, by WILLIAM HOWE TOLMAN, Ph.D., is *Circular No.* 18 in the series of "Contributions to American Educational History," edited by Professor HERBERT B. ADAMS, issued by the Bureau of Education, several of which we have reviewed heretofore.

The history of higher education in Rhode Island is here shown to be the history of Brown University. It is of further interest, however, as related to the union of Church and State among the New England Puritans, which resulted in the establishment of Rhode Island College, in order that members of the Baptist denomination might have an institution where a liberal education could be acquired under its auspices. But it begins with an account of colonial education and the free public-school system as at first undertaken at Newport in 1640 and in Providence in 1663, and the efforts of John Howland and Henry Barnard to promote it. Next follows a study of academies and preparatory schools—the University Grammar School, under James Manning, who was the first President of Rhode Island College, Greenwich Academy, and the Friends' School—the three most important advances toward the establishment of the university. Meanwhile, the education of women was also promoted. The Young Ladies' High School, John Kingsbury, principal, 1828–58, was the pioneer in the institutions at Providence for higher education. Brown University was founded in Warren in 1764, the whilom Rhode Island College, and six years later removed to Providence. The change of name was made in accordance with a provision of the charter. The design of the college originated with the Philadelphia Baptist Association, who decided to place it in Rhode Island. The first president of the college was James Manning, a native of New Jersey, who, at the time the college was chartered, was the principal of a Latin school he had founded in Warren. The "Latin school" is still continued, but it is now known as the University Grammar School—a flourishing tender of the university. Manning, from the out-

set of his connection with the college, made its interests his life work. To his labors and the labors of his successors—Wayland, Sears, Robinson, and Andrews, and the labors of Professors Lincoln, Harkness, Dunn, Diman, Gammell, and others—the institution owes its elaboration for thorough educational work and flourishing condition, to which the greater part of the circular is devoted.

HISTORY OF EDUCATION IN MARYLAND. *Circular No.* 19. By BERNARD C. STEINER, Ph.D. (J. H. U.). Bureau of Education, Washington, D. C.

Additional interest attaches to this history because, after Virginia, "it was the first colony on the South Atlantic seaboard to be planted, and within its borders the Catholic Lord Baltimore first adopted in America the idea of making all religions free." But the educational history of the colony and of the Protestant province into which it was evolved within a generation from the time it was granted to Lord Baltimore show that the early conditions of life in the colony were not favorable to schools of any kind. The settlers were for the most part planters or frontiersmen, who had but little need and less care for education. The few exceptions among the wealthier colonists and fox-hunting gentry of England, who desired education, gained it by private tutor or outside the colony. Some went to William and Mary College in Virginia, others to England, and still others, of Roman Catholic parentage, like Charles Carroll, sought it on the continent of Europe. Yet before Maryland was granted to Lord Baltimore in 1639, Professor Sollers, in the first chapter of the monograph, points out that on November 22d, 1624, Edward Palmer, a gentleman of Warwickshire, who had long lived in London, "made a will, establishing a college within the limits of the present State of Maryland. He was a virtuoso, and in 1622, with the design of founding a college, had procured a patent for land from the Virginia Company. The site he chose was long known as Palmer's Island, but is now called Watson's Island," in the Susquehanna River just above Havre de Grace. The plan is described in some detail, even to the provision for an art school. But this ideal was not realized for over two centuries, until Street gave Yale its art school. Pro-

fessor Sollers also traces at considerable length the course of secondary and primary education in the State from the Revolution to the organization of the present school system in 1865 and 1868. Then follows a sketch of the first University of Maryland, by Dr. Steiner, accompanied by authorized sketches of Washington and St. John's colleges. He also gives a history of the "dead colleges" of Maryland—among others, of Cokesbury College, the first attempt of the Methodists to found an institution for higher education. The history includes sketches of the various colleges and professional schools —of theology, law, medicine, and dentistry—by persons connected with them, from the standpoint of the institutions themselves. The sketch of the Johns Hopkins University is by President Gilman. This institution, though not yet twenty years old, has long since taken a place among the foremost of American institutions of learning.

FOODS: NUTRITIVE VALUE AND COST, by W. O. ATWATER, Ph.D., Farmer's Bulletin No. 23, U. S. Department of Agriculture, is a brochure of thirty pages, "is the first of a series of popular bulletins on the nutritive value and economy of food which the Office intends to prepare," than which surely the Office could not well have made a better beginning —one more likely to be useful to and win the attention of every intelligent housewife, as well as farmer, who may be so fortunate as to receive a copy. The title well expresses the purpose, and under it follows a concise statement of the composition of food materials, their relative digestibility, adaptability to the needs of the body, dietary standards, relations to health, etc., of practical utility to everybody.

TRANSACTIONS OF THE ANTISEPTIC CLUB. Reported by ALBERT ABRAMS, a member of the San Francisco medical profession. Illustrated by pen-and-ink sketches. Price, $1.75; in large paper, extra quality, gilt top, uncut edges, half vellum cloth, limited to subscriptions received and numbered, price, $2.75. New York: E. B. Treat.

This book is devoted to humor—illustrating by pen and pencil the fads and foibles of modern Æsculapians—but comprehends enough truth to be profitable as well as amusing. Truth is often

a nauseous pill to doctors as well as to other people; but here it is sugar-coated, and the thoughtful physician will find enough to excite his recollections and awaken his interest. The organization of the club, the various papers read and discussed, the testimonials considered, the cases submitted, the hypoderm, and finally the dental clinic at its rooms—all will be found redundant with effervescent exuberance. Charles Lamb says, "A laugh is worth a hundred groans in any market." Here a hundred laughs may be provoked to animate the muscles of mirth, atrophied from the disuse incident to the cares and anxieties of medical practice. Those *in quest* of a *case* find here a needed *repose* in the refreshing outbursts of wit and humor which bubble and sparkle with health-giving cheer as the tale is told: and not a line will be found to be "*extra dry*," though some of it is not *nice*.

SOME NEW JOURNALS:

HEALTH, SANITATION, AND CLIMATOLOGY OF THE SOUTHERN STATES. A pictorial magazine of thirty pages. Vol. I., No. 1, January, 1895. Subscription price, $1 per annum. Edited and published quarterly by WALTER C. MURPHY, M.D., 932 K Street, N. W., Washington, D. C.

"The object of this journal is to collect, compile, edit, and aid in the dissemination of information on hygiene, health, medical mineral waters, sanitary science, and medical climatology." In illustration of this object, however, the frontispiece is a by no means flattering portrait of the distinguished President of the New York Post-Graduate Medical School, D. B. St. John Roosa, A.M., M.D., LL.D.

There follows an interesting abstract of recent literature on sanitary subjects and sanitary resorts, with several illustrations of the attractive scenery of North Carolina.

THE NEW JERSEY FORESTER, of which we have received No. 2, for March, a "bi-monthly journal" of twelve pages, two columns to the page, devoted to the development of our forests, a thoroughly worthy object, and should not fail of support. "Leaders of Forest Reform," a sketch with portrait of Bernhard E. Fernow, chief of the Forest Division of the Department of Agriculture; "The Wood of the White Cedar,"

by F. Roth; "The Relation of Birds to the Distribution of Forests," by Dr. Spencer Trotter; and an interesting excerpt from contemporary literature, are the attractive features of this number. Price, $1 a year. Edited by JOHN GIFFORD, May's Landing, N. J.

JOURNAL OF MEDICINE AND SCIENCE. The official organ of the Maine Academy of Medicine. Pp. 24, two columns to the page. Price, $1 a year. Edited by E. E. HOLT, M.D., assisted by J. A. SPALDING, M.D., Portland, Me.

Subscriptions and communications relative to advertisements or business matters should be addressed to George H. Haynes, Business Editor, 283 Vaughan Street, Portland Me.

A lively journal, filled with timely topics of interest to all physicians.

THE NATIONAL BOARD OF HEALTH MAGAZINE, A REVIEW OF SANITARY THERAPEUTIC SCIENCE. *Published monthly, Vol. IX., No. 3, March,* 1895. Pp. 24; price, $1 a year. The International Board of Health Journal Company, New York City, U. S. A. And here follows a list of foreign agencies in twelve of the greatest cities in the world.

Remittances should be made by post-office money order, bank check, draft, or registered letter, payable to the order of T. W. Stemmler, Treasurer. The unexpired subscriptions to "The Doctor of Hygiene" will be filled by the *National Board of Health Magazine,* ALLEN H. STILL, editor.

We confess to great surprise, indeed we are quite taken aback, and wonder where we have been, or, rather, where this new (to us) nine-year-old health magazine has been that we should not have encountered it before. It contains an excerpt of contemporary sanitary literature; a very just criticism of the "Smead system" of contaminating the air of schoolhouses, by O. B. Server; and "Physicial Nutrition," by David Wark, M.D.

ANNALES D'OCULISTIQUE—a periodical of world-wide repute, founded in 1838 by Cunier, the most distinguished, indeed, almost the only oculist of his time worthy the name—commences its fifty-eighth year as an actual international

periodical, being published simultaneously and uniformly each month in the French and English languages. Each number contains from 64 to 80 pages, forming annually two volumes of about 1000 pages. These contain original articles and analyses or reports of all that appears in ophthalmology in all countries.

Fifty reprints of original articles exceeding eight pages of text will be sent gratuitously to authors.

Subscriptions commence January 1st of each year, and are received only for the entire year. At whatever season subscriptions may be received, all the numbers which may have appeared since January 1st of the year will be sent to the subscriber.

The subscription price of the English edition is $5 a year. Subscriptions may be sent by mail from any country, inclosing draft or postal order. For the English edition to the Transatlantic Publishing Company, 63 Fifth Avenue, New York; and for the French edition to Dr. E. Valude, 198 Boulevard Saint-Germain, Paris.

Concerning matters relating to the editorial department, communications should be addressed to Dr. GEORGE T. STEVENS, 33 West Thirty-third Street, New York, for the English edition; or to Dr. E. VALUDE, 198 Boulevard Saint-Germain, Paris, or to Dr. D. E. SULZER, 7 Quai du Mont Blanc, Geneva, Switzerland, for the French edition.

All articles appearing in one edition will appear also in the other. The advantages of this arrangement will be apparent to authors.

SELF-CULTURE, a monthly devoted to the interests of the Home University League. A magazine of 64 pages. EDWARD C. TOWNE, B.A., Editor; M. B. GIBLY, Business Manager. Price, $2 a year; 20 cents a number. Chicago and New York: The Werner Company. Of this we have received two copies of No. 2—for May—but none of No. 1, of which the May number contains numerous complimentary notices. The articles in this number are for the most part compilations of interesting subjects, old and new, unsigned. The leading are "Eli Whitney—A Shakespeare of Invention;" "Is Vitality Electrical?" "The Principle of Evolution in Nature;"

"The Story of Human Progress—Primitive Man," etc.; "The Story of the Plague in History;" "The Genius of Shakespeare;" "Athletic Excesses in Universities;" excerpt under "Of Interest to Workers;" stories for young folks; women's department, etc.

MEDICINE: A Monthly Journal of Medicine and Surgery. HAROLD N. MOYER, M.D., Editor. Pp. 64. May, 1895. Price, $2 a year. Detroit, Mich.: George S. Davis.

Its promise is—good contents: "Herpes Zoster Gangrenous," with colored plate, by W. L. Baum, M.D.; "Sarcoma of the Kidney in Children," by D. A. K. Steele, M.D.; "The Employment of Cardiac Sedatives in Heart Diseases," by H. A. Hare, M.D.; "Prostatic Tuberculosis," by Frank Lydston, M.D.; "Medical Septicæmia," by W. S. Christopher, M.D.; "Grip," by Seth Scott Bishop, M.D. And it is hardly necessary to say that it is well gotten up, considering the publisher.

SURGERY TWO HUNDRED YEARS AGO is a pictorial little book by FRANK A. RUFF, Esq., of St. Louis, Mo., showing how bones and muscles were mended, and how other parts of the body were rent and repaired when there was no surgery. A copy will be sent to any surgeon on application. F. Tennyson Neely, Publisher, New York.

GLYCOZONE AND HYDROZONE: The Therapeutical Applications of Peroxide of Hydrogen. By CHARLES MARCHAND, Chemist. Ninth Edition.

This book of 200 pages, which contains all information on the subject, with reprints of elaborate articles by leading contributors to medical literature, will be mailed to doctors mentioning this publication. Send full address to Charles Marchand, 28 Prince Street, New York.

A MAP OF THE WORLD is necessary to every physician, as to everybody else, who would keep apace with the progress of nations and know how to thread them. The Rio Chemical Company, of St. Louis, Mo., has issued such a map. It is bordered with statistics of population and other notes, of constant utility to all readers.

CONTEMPORARY LITERATURE.

"THE PROGRESS OF THE WORLD" of the May *Review of Reviews* trenchantly sums up the significant events of the month preceding. Prominent topics thus treated are the income tax decision, the Chicago election and the triumph of civil service reform, the Cuban revolt, the Venezuelan boundary issue, and the British claim in Nicaragua. The editor makes some interesting comments on recent progress in the South, notably illustrated by railroad and other industrial development in Florida, the improvement of various Southern harbors, the enforcement of the South Carolina liquor law, and other encouraging signs. At the same time the low prices of sugar and cotton are discussed in their relation to the prevailing feeling of unrest among the agriculturists of the Gulf States.

FORESTRY REFORM.—*The Century* for many years has been a stanch advocate of forestry reform, and in the current number it follows up the recent symposium on the forestry question with an editorial article calling attention to the fact that in the last Congress conservative measures for the preservation of the public forests were defeated by Western members, and appealing to that section of the country to give to the subject the attention which it urgently demands.

The irrigation movement in the West finds a new platform in *The Century* for May, to which Mr. William E. Smythe, Secretary of the National Irrigation Association, contributes an article entitled "The Conquest of Arid America," which is attractively illustrated by Mary Hallock Foote and Harry Fenn, with the addition of maps. A feature of this article is a table of estimates of the expenditures of the Mormon Church in Utah, prepared especially for this article by A. M. Musser, historian of the church, covering the period of forty years, and now published for the first time. The presidents and bishops of the church agree that the estimates are as fair as they can be given. The article deals with irrigation experi-

ments and achievements in Utah, Arizona, California, and elsewhere in the West, both in their industrial and social aspects, and forecasts the future of irrigation as it appears to a leader of the movement.

PEDAGOGIC CRAZE FOR NOVELTY.—The pedagogic impulse to create devices for awakening the interest of the pupil becomes sometimes a craze for novelty. Change at any price and change of any kind is clamored for. It is a trite saying that change is not progress. It is more apt to be movement in a circle or even retrogression. An amusing example was lately furnished in educational circles. A superintendent of rural schools defended their want of classification as an advantage. It was "individual instruction," and, as such, an improvement over that of the graded school of the cities. His reactionary movement received the support of some of the advocates of educational reform on the ground that it was a new departure. This happened at a time when one half of the school children in the United States are still taught, or, rather, allowed to memorize their text-books by this method. The sub-committees on training of teachers and on the organization of city school systems have brought forward, in their respective reports, the latest devised measures for the perfection of normal schools and the procurement of expert supervisors for city school systems. The importance of the recommendations regarding schools for the training of teachers is seen when one recalls to mind the fact that the entire upward movement of the elementary schools has been initiated and sustained by the employment of professionally trained teachers, and that the increase of urban population has made it possible. In the normal school the candidate is taught the history of education, the approved methods of instruction, and the grounds of each branch of study as they are to be found in the sciences that it presupposes.—*From "Elementary Education," by the* HON. WILLIAM T. HARRIS, *United States Commissioner of Education, in North American Review for May.*

THE METHOD OF TEACHING LANGUAGES.—Instead of books and grammar rules, the teacher of languages should

commence with giving the foreign name to all the familiar objects which the school-room contains, and with which it is surrounded. The door and the window, the teacher's rostrum and the children's seats, the fire, with the tongs and poker, and the coal-scuttle, the pictures on the wall, and the lobby, where caps and great-coats, and umbrellas for a rainy day, and all the paraphernalia of a well-ordered school are marshalled in orderly array. And not only inside but outside the school-house, everything that meets the eye of the observant tyro should be greeted with the new name—the old castle on the brae, the hollow cave in the glen, the flowers in the meadow, the cloud-cleaving Ben that kisses the sky, and the garden of flowers in the green meadow; also all living creatures that habitually meet the eye and delight the soul of a healthy young child—the dog that wags his tail, the cock that crows, the hen that pecks the gravel for grains of corn, the bird that sings in the wood, the duck that paddles in the pond, and the trout that rises to the fly; all this in the direct and circumambient drama of living interest, not grammar rules and gray books, should form the material used by the teacher of languages, just as directly as the stones from the quarry form the material out of which the cunning architect trims his cottage or piles his palace.—JOHN STUART BLACKIE, *in Littell's Living Age, No.* 2651.

SOME HELP WE GET FROM MICROBES.—Ordinary digestion is performed in the stomach and the intestine by means of soluble ferments secreted by the organic cells, which attack alimentary substances, dissociate them, and render them assimilable; and this is perceived to be a function very similar to that of microbes. The digestive passages, however, contain immense quantities of microbes continually brought in with the food, multiplying infinitely, and performing exceedingly complex offices. Even if we take up only a few of these offices, we are compelled of necessity to assume that they intervene in digestive operations, either as aids to the organic diastases or as themselves effective agents. M. Duclaux, insisting on this point, has remarked that some celluloses are capable of being attacked only by microbes, no organic juice having sufficient strength to affect them. M. Pasteur does

not believe in the possibility of digestion in a medium completely deprived of microbes.

Of the chemical activity of microbes, what we know is as nothing in comparison with what it may be. Every species, every race, every variety of microbe is charged with a special function; the division of labor is carried among them to its extreme limits, so much so that in any chemical reaction each microbe takes its part in producing the process at different stages. Each variety has its duty in the work, determines a partial dissociation of the material which another species completes, and so on to the extreme simplification of organic matter, reduced to its elementary constituents, or to such conditions as to be assimilable by the plant.—*From "Microbes as Factors in Society," by* L. CAPITAN, *in The Popular Science Monthly for May.*

WEATHER PREDICTIONS AND METEOROLOGY.—The progress in improving the methods of predictions has been very slight since their first beg nning, and whatever gain has been made has been due to the increase of telegraphic and other facilities for the rapid transmission of data and the predictions themselves. Our weather maps have remained practically unchanged in form for years, and I venture to suggest that if the Weather Bureau would give us, for only one year, maps of the weather conditions two or three times a day, as shown by records from all of the State meteorological stations, as well as those from the present general government stations, we should have the means of studying the process of storm development with a much greater probability of adding to our present knowledge than is likely to occur without some such change in the plan now in use. In order to have storms so minutely portrayed as this would allow, we who are students would gladly wait for the maps a month or two, as might be necessary. It is still too soon to hope that observations aloft may be made with regularity, but the missing link necessary for the true understanding of storms is undoubtedly to be found in the atmospheric conditions above the earth's surface. All long-range weather predictions are pure charlatanism, and any scientist who would have the temerity to foretell the weather conditions for a coming season, or even the coming

week, would very deservedly lose caste with his fellow-workers.—*From "The Progress of Meteorology," by* PROFESSOR FRANK WALDO, *in North American Review for May.*

RESULTS OF CARPET-BAG POLITICS IN THE SOUTH.—Republicans from the North flocked to the South, whom the blacks, viewing them as representing the emancipation party, naturally welcomed and followed. There were honest carpet-baggers, no doubt, but most such were idealists, little likely to reconcile the races, nearly certain to be misled by their shrewd but unprincipled colleagues. The good and the bad alike did their best to inflame the negro's sense of independence and to engage him in politics. His former wrongs were dwelt upon, and the ballot held up as a providential means of righting them. The negro was too apt a pupil. In their days of serfdom the negroes' besetting sin had been thievery. Now that the opportunities for this were multiplied, the fear of punishment gone, and the carpet-bagger at hand to encourage it, the prevalence of public and private stealing was not strange. The colored legislators of South Carolina furnished the State House with gorgeous clocks at $480 each, mirrors at $750, and chandeliers at $650. Their own apartments were a barbaric display of gewgaws, carpets and upholstery. The minority of a congressional committee recites that "these ebony statesmen" purchased a lot of imported china cuspidors at $8 apiece, while senators and representatives "at the glorious capital of the nation" had to be "content with a plain earthenware article of domestic manufacture."—*From "A History of the Last Quarter-Century in the United States," by* E. BENJAMIN ANDREWS, *in the May Scribner.*

NEW YORK'S WATER SUPPLY.—We are in the habit of saying that the water we drink comes from Croton Lake, thirty miles north of the city, in Westchester County, but that is only a part of the truth. The fact is, that Croton Lake was made by damming the Croton River when our system was begun in 1835–42. We now take that water, and the water of several other lakes, ponds, and rivers that are in a great valley or depression in the earth called the Croton watershed. We

keep stored up and ready for use about 17,000,000,000 gallons of water in the following natural and artificial reservoirs: Croton Lake, Lake Mahopac, Lake Gilead, and Kirk Lake, Middle Branch, East Branch, Bog Brook, and Barrett Pond. Their names sufficiently describe the character of these great goblets of crystal water which nature and man have arranged for the needs of the great city. But these are so insufficient that, although it is believed we could draw 250,000,000 gallons a day even in dry weather, we are going to take into our system three more reservoirs, which will allow us to store 13,000,000,000 gallons more than we can store at present. And as even these will not long supply our growing needs, we are about to build the greatest dam the world ever saw. It is already called the Quaker Bridge Dam. It is to be built five miles south of Croton Lake, back of the town of Sing Sing, where the great State prison is. It will be a great pyramidal-shaped wall of solid masonry 264 feet high and 1500 feet long, and will cost, the officials think, at least $6,000,000. When it is finished, a magnificent rich farming country will be flooded and turned into one immense glass of water for old Father Knickerbocker (as we call our patron saint) and his children. The water that will bank up against that dam will rise up over many, many farms, and houses, and barns, and villages for a distance of no less than sixteen miles, and the present dam at Croton Lake will be thirty-five feet under the surface of the water. Now we store 17,000,000,000 gallons of water, but then we will have a liquid treasure of 84,600,000,000 gallons.—*From Harper's Round Table.*

JULIAN RALPH writes entertainingly in the May *Harper's* of "Sunny Mississippi," including the home of the late Jefferson Davis, at Biloxi, now falling into decay. When Mr. Ralph visited the mansion of the President of the Confederacy a few months ago a storm had just overthrown many of the fine trees on its grounds, "the gate was tied up, and the house was closed, so that had it been pointed out to me as a haunted house, abandoned by its owners, the scene presented there would have been exactly accounted for."

GOLD-MINES IN CEMETERIES.—A writer in *Le Temps*, of Paris, has been travelling in America, and, of course, relates

his " impressions." What struck him particularly was not the Falls of Niagara, the inquisitiveness of reporters, or the consumption of pie, but the fillings in American teeth. He has consulted the statisticians, and finds that the amount of gold annually pounded into our dental cavities reaches the respectable figure of 800 kilogrammes, representing a value of half a million dollars. All this precious metal is buried with the Yankees when they die, and consequently at the end of three short centuries the cemeteries of the United States will contain gold to the value of $150,000,000. He thinks this will prove too tempting to the practical mind of the future American, and foresees the day when companies will be organized to mine the cemeteries and recover the gold secreted in the jaws of deceased ancestors.

ASTONISHED MULES.—Six mules that had for four years hauled cars in the lower workings of the Spailand coal shaft, near Lacon, Ill., were brought to light recently, says an exchange. In all that time the mules had seen no light stronger than the flicker of the Davy lamps the miners carried. The sun was in its zenith when they reached the surface. The astonished mules closed their eyes to shut out the flood of light and kept them tightly closed while they were led to the pasture lot, a mile distant, and turned loose. There they stood trembling, as if afraid something evil was about to befall them. Presently they half opened their eyes, and peered round in amazement. When they had become accustomed to the sunlight they elevated their heads. Toward sundown they broke into a chorus of joyous brays. After a quarter of an hour of that music they took to kicking, jumping, whirling around the teetotums, and rolling on the sod as if they had gone mad. The sun and pure air were more to them than food, and they refused everything put before them to eat.—*Scientific American.*

A UNIQUE AMBULANCE SERVICE.—The establishment of an " ambulance street car" service in St. Louis is the putting into effect of an idea long contended for by the health commissioner of that city, Dr. George Homan. Efforts to secure legislation having failed, Dr. Homan succeeded in interesting the officials of a street car company, who have built an ambu-

lance car after a plan made by the doctor. This vehicle in itself is only a modified street car, especially constructed for easy and relatively noiseless running along trolley lines, and fitted up with such apparatus as might be needed by invalids who temporarily occupy it while *en route* to a hospital. But the plan on which the ambulance car is to operate is believed to be altogether unique. It will pass over regular routes, including. presumably, all trolley lines of the city, for the exclusive purpose of conveying sick or injured persons to and from hospitals. As it runs according to schedule, patients may be in readiness at any given locality at the time when the car is due there. It is expected that hospitals not on a trolley line will build terminals connecting them with the nearest railway, that patients may be brought by the ambulance car to their very doors.—*Harper's Weekly.*

SISTERS SHOULD LOOK OUT FOR THEIR BROTHERS in countless little ways. A sister can make home so pleasant and cheery that her brother will prefer it of an evening to any other place. She may take pride in having her brother's escort when she goes about, and even if she does not particularly care to go somewhere when he proposes it for amusement, she will oblige him if she is the loving and unselfish sister I have in mind, and sacrifice her own inclination to keep him company.—*Harper's Young People.*

HARPER'S ROUND TABLE.—The weekly paper which for fifteen years has been known as *Harper's Young People* has undergone a change of name to *Harper's Round Table*—a change in title which has not been made arbitrarily, but which is an expression of the paper's already extended field. The broadening of the periodical has been going on for some time, and corresponds with a real growth and a design to appeal to a larger circle of readers. Departments especially devoted to amateur sport, notably in the leading schools of the country, which will be conducted by an editor well qualified by experience in this field, and whose attention will be wholly given to this work; a department established in recognition of the extraordinary interest at present taken in bicycling, including maps of roads, that will be useful to wheelmen in all parts of

the country, supplying a need that has been long felt, but has not yet been met; the remodelling of the page in its proportions, type, etc.; employment of new as well as the maintenance of the old contributors of fiction and special articles—these are some of the particulars in which the change referred to will manifest itself.

THE WOMAN CYCLIST has come to stay, and her father, husband, and brother hail her with delight.

> "Her flesh is firm, her muscles strong,
> Her rounded limbs might well belong
> To a goddess of olden time,
> As she glides along on her silent wheel,
> All men admire, for all men feel,
> That her vigor is sublime."

—JEANNETTE REID DURKEE, M.D., *in the Northwestern Sanitarian.*

RIBOT'S "DISEASES OF PERSONALITY."—The Open Court Publishing Company, of Chicago, have just issued a second edition of their authorized translation of Th. Ribot's "Diseases of Personality," the first having been exhausted in three years. The popularity of Professor Ribot's works is certainly deserved, as they form delightful introductions to the study of psychology, and are remarkable specimens of economy and lucidity of exposition. Pp. 164, cloth, 75 cents; paper, 25 cents.

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Experiments with Tuberculin on Non-tuberculous Cows. *Bulletin* 82. James Law.

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Spraying of Orchards—Apples, Quinces, Plums. *Bulletin* 86. E. G. Lodeman.

Analytic Work. Abstract from the Report of the Pennsyl-

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Amount and Character of Organic Matter in Soils, and its Bearing on the Storage of Water in Reservoirs. Thomas M. Drown, M.D., Boston, Mass.

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Improved Water Methods of House Drainage. William Paul Gerhard, C.E., New York.

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INDEX.

A Brave Physician, 139.
Abdominal Organs, Wound of, 361.
Absorption of Odors by Milk, 77.
Adami, Geo., Bacillus Pyocyaneus, 212.
A Fly in the Beer, Ed., 526.
Against the use of Curs for the Promotion of Surgery, Ed., 521.
Alcoholism and "Gold Cures," Tanner, 326.
Altitude of Jerusalem, 378.
American Medical Association, 480.
American Medical Publishers' Association, 480.
American Public Health Association, Proceedings, 23, 124, 200
A New Official's Expert, 525.
Antikamnia as a Sedative, 438.
Antiseptic Clothing, Pietra Santa, 140.
Antiseptic Properties of Formic Aldehite, Taillat, 107.
Antitoxin in Diphtheria, Ed., 243.
Army, Surgeon-General's Report, 249.
Artificial Teeth, A New Danger from, 199.
A Slight Mistake, 339.
Association of Military Surgeons, 480.
Atrophy of the Foot in Coxalgia, 360.
Auntie Septic, L. D. W., 407.
Auld, John, Diet for Health, 118.
Average Duration of Life among Physicians, 548.

Bacillus Pyocyaneus, Death by, Adami, 212.
Bacilli Tuberculosis in Cigars, 247.
Baths, Free Public, Ed., 519.
Bell, A. N., Long Island Water Basin, 322.
Bell, H. K., Mortality and Morbility Reports, 51, 142, 262, 340, 445, 529.
Bermuda, 471.
Bicycle for Women, Bissell, 90.
Boston Hospitals Receive Bequests, 527.
Bread, The Microbes of, 123.
Brennan, T. M., School Hygiene, 202.
Brooklyn's Most Infamous Nuisance, Ed., 74.
Brooklyn's Vital Statistics—Births? 154.
Browne, John Mills, M.D., Obituary, 71.
Bubonic Pest in Hong Kong, Martin, 171.

Cameron, J. G., School Hygiene, 32.
Cameron, Kenneth, Bacillus P., 212.
Cancer of the Colon, Demons, 170.
Car Ventilation, G. P. Conn, 124.
Catarrhal Affections, 362.
Cause of Epidemics, Smith, 93.
Cesspool Water Pollution, Test of, 518.
Chancellor, C. W., Sanitary Brushwood Picked up in Europe, 193.
Chancellor, C. W., Inoculation for Diphtheria and Croup, 11.
Chancellor, C. W., Sewerage in Foreign Cities, 409.
Chase, J. C., Household Water Supply, 399.
Cholera's Reduction of Death-Rate, 281.
Cholera in Europe, 1892, Review of, 462.
Christian Science, 22.
Cigars, Bacilli Tuberculosis in, 247.
Chico, Jesus, Mexican Typhus, 218.
Climate of Canada, Influence of, on Health, Hingston, 138.
Climatological Association, 868.
Climatological Year at Los Angeles, 288.
Cold Baths in Typhoid-fever, 360.
Community without Vaccination, Kerr, 246.
Compliment for Experimental Science, Frank L. James, 16.
Conn, G. P., Car Ventilation, 124.
Consumptives, Marriage of, Paquin, 25.
Consumptives, Climatic Segregation of, Sewell, 25.
Corbally, T. P., Medical Excerpt, 165, 236, 358, 436, 516.
Coryza, Remedy for, Maurel, 240.
Costly Unsanitary Houses, 364.
Credit Side of Cholera Account, 281.
Crothers, T. D., Influence of Inebriety on the Public Health, 35.
Cyclist, The Woman, 568.

Demons, M., Cancer of the Colon, 170.
Desroches, J. I., Hygiene in Medical Education, 428.
Desquamation in Typhoid-fever in Children, 359.
Diet for Health, John Auld, 118
Diphtheria and Sewer Air, 233.
Diphtheria, Antitoxin in, Ed., 243.

Diphtheria, Inoculation for, Chancellor, 11.
Domestic Garbage Burner, Durgin, 137.
Domestic Garbage Disposal, Morse, 296.
Donlin, F. W., Prevention of Gout, 234.
Doré, J. E., Ventilation of Schools, 208.
Doty, Dr. Alvah H., Health Officer, 178.
Downes, Edward, Sewage in Amsterdam, 58.
Drinkers and Children, 435.
Durgin, S. H., Domestic Garbage Burner, 137.

Endemann, H., Peroxide of Hydrogen, 165.
Epidemics, Cause of, Smith, 93.
Europhen as a Substitute for Iodoform, 172.
Exercise, Dryden, 199.
Expressmen and Small-pox, Ed., 245.

Fairley, William, Pneumatic System for Small Sewerage Works, 511.
"Faith Cure" Victim, 433.
Father Denza, 368.
Fly, A, in the Beer, Ed., 526.
Folding Bed, The, 374.
Formento, Felix, Prevention of Yellow-fever, 134.
Fortier, L. L., Physiology in School, 209.
Free Antitoxin, Ed., 439
Free Public Baths, Ed., 519.
Fuller, C. W., Sand Filtration of Water, with Results, 37.

Garbage Disposal, Inglis, Herring, Durgin, 137.
Garbage Disposal, Manley and Stewart, 3, 97.
Garbage Disposal, Morse, 223.
Gauthier, S., School Hygiene, 201.
Gerhard, W. P., Work of the Sanitary Engineer, 481.
Gerhard, W. P., Sanitary Engineering, 214.
Gifford, John, Healthful Influence of New Jersey Forests, 17.
Glycogen in Tumors, Brault, 239.
Gold as a Medicine, Ohmann-Dumesnill, 236.
Gold in the Water of the Ocean, 515.
Gout, Prevention of, Donlin, 234.
Greatest Engineering Undertaking of To-day, Ed., 76.
Greenwood, Major, London Water Supply, 217.
Grip becomes Tuberculous, 359.
Grippal Origin of Rheumatism, Courtade, 518.

Harrington, Mark W., Sanitary Climatology, 181.
Hay-fever, New Cure for, 362.
Health of the Army, Report, 249.
Health of the Navy, Report, 254.
Health Officer of the Port of New York, New, 178.
Healthful Influence of New Jersey Forests, Gifford, 178.
Hematemesis and Ulceration of the Stomach, M. Ferrand, 517.
Herring, Rudolph, Disposal of Garbage, 137.
Herring, W. R., How to Burn and how to Save Gas, 316.
Hingston, Influence of the Climate of Canada on Health, 138.
Hiscock, C. O., National Board of Health, 289.
Home Sanitation, Morris, 385.
Household Water Supply, Chase, 399.
How to Burn and how to Save Gas, Herring, 316.
How to Swindle the Public, Ed., 554.
Hyde, Belcher, Papine as a Sedative, 517.
Hygiene of the Young, Cameron, 32.
Hygiene in Elementary Education, Gauthier, 201.
Hygiene of the Kidneys, Simes, 241.
Hygienic Instruction in Schools, Monjaras, 200.
Hygienic Medical Education, Desroches, 428.

Idleness, 77.
Immigration, 50.
Inebriety Restriction in Norway, 496.
Infectious Diseases in the Public Schools, Morris, 497.
Influence of Inebriety on the Public Health, Crothers, 35.
Inoculation for Diphtheria and Croup, Chancellor, 11.
Insomnia—the Ravelled Sleeve, M. de Fleury, 197.
Insomnia, Trional for, 437.
Inspection of School Children's Eyesight, Reed, 202.

James, Frank L., Compliment for Experimental Science, 16.
Jenkins, Dr., Special Pathologist, 368.

Kidneys, Hygiene of, Simes, 241.

Laberge, Health in Montreal, 206.
Lesson of the Diphtheria Epidemic, Ed., 73.
Let the Inebriate Smile Again, 496.
Lincoln, D. F., Temperance Teaching, 434.

Lodgings for Seamen on Shipboard, 470.
Lofty Walls, Ed., 525.
London Water Supply, Greenwood, 217.
Long Island Water Basin, Bell, 322.
Long lived Americans, Warner, 93.
Loomis, The late Dr. A. L., 282.
LITERARY NOTICES AND EXCERPT:
A Congested District, Littell's Living Age, 478.
A Unique Ambulance, 566.
Altitude of Jerusalem, Hutton, 378.
Antisepsis and Antiseptics, Buchanan, 283
Antitoxin, Review of Reviews, 186.
Arab Character, Poultney Bigelow, 285.
Astonished Mules, 566.
Beautiful and Easy Plants to Grow, Parsons, 377.
Bicycle for Women, Bissell, 90.
Buffalo Medical and Surgical Journal, 479.
Cause of Epidemics, 93.
Characteristics of George Inness, Sheldon, 287.
Charleston's Outer Aspect, Julian Ralph, 191.
Chemically Pure Hypophosphites, Gardner, 283.
Christmas Century, 90.
Colorado Climatologist, 96.
Foods, Nutritive Value of, Atwater, 555.
Forestry Reform, 560.
Free-Trade Struggle in England, Turnbull, 371.
Funk & Wagnall's Dictionary, 369.
Glycozone and Hydrozone, Marchand, 559.
Gold Mines in Cemeteries, 565.
Harper's Round Table, 567.
Helmholz and America, Martin, 374.
Help for Consumptives, Review of Reviews, 374.
Hernia, Manley, 184.
Higher Education in Iowa, Parker, 84.
Higher Education in Tennessee, Merriam, 83.
History of Education in Connecticut, Steiner, 78.
History of Education in Delaware, Powell, 82.
History of Education in Maryland, 554.
History of Higher Education in Rhode Island, 553.
Home Journal, 192.
INDEX to Volume XXXIV., 571.
International Medical Annual, Treat, 473.
Keeley Cure, 94.
Littell's Living Age, 378
Long-lived Americans, Warner, 93.
Map of the World, Rio Chemical Co., 559.
Medical Register of Philadelphia, 285.
Men and Women in New York, Harper's Weekly, 190.
Mental Power from Manual Training, Henderson, 477.
Method of Teaching Languages, 561.
"Missing Link," The, Allen, 475.
Mrs. Ballington Booth on American Slums, 286.
New York's Water Supply, 564.
North American Review, 88, 478.
Origin of Language and the Loges Theory, Noire, 184.
Pedagogic Craze for Novelty, 561.
Penalties of Ignorance, Lady Priestley, 476.
Physicians' Vade-Mecum, Wimmer, 370.
Pleasant Debt we Owe Dr. Holmes, Scribner's, 87.
Popular Scientific Lectures, Mack, 183.
Practical Sanitation, Living Church, 93.
Proceedings Conn. Medical Society, 371.
Progress of the World, 560.
Publications Received, 378, 568.
Rarefied Air in Mountain Climbing, 376.
Relapse and Immunity after Diphtheria Antitoxin, 187.
Report of Commissioner of Education, 551.
Report of Regents, Smithsonian Institution, 372.
Results of Carpet-Bag Politics, 564.
Review of Reviews, 89, 378.
Ribot's Diseases of Personality, 568.
School-Room Ventilation, Knight, 190.
Science, 95.
Science in the Same Boat with Theology, Stead, 475.
Secret of Dr. Holmes' Success, Lodge, 89.
Secret of Long Life, Saint-Hilaire, 373.
Sexual Neurasthenia, Beard and Rockwell, 184.
Sisters Should Look out for their Brothers, 567.
Some Help we Get from Microbes, 562.
SOME NEW JOURNALS:
Annales d'Oculistique, 557.
Health, Sanitation, and Climatology of the Southern States, 556.

Journal of Medicine and Science, 557.
Medicine, 559.
Self-Culture, 558.
The National Board of Health Magazine, 557.
The New Jersey Forester, 556.
Suggestive Therapeutics in Psychopathia Sexualis, Von Schrenck-Notzing, 474.
"Sunny Mississippi," 565.
Surgery Two Hundred Years Ago, Ruff, 559.
Tesla's New Electrical Possibilities, Martin, 478.
The Folding Bed, Harper's Weekly, 374.
The Woman Cyclist, 568.
Thoughts on Religion, Romanes, 550.
Tramp Life, Josiah Flynt, 478.
Transactions of Congress of American Physicians, 185.
Transactions of the Antiseptic Club, Abrams, 555.
Trans. Med. Assoc. Georgia, 371.
Trans. Med. Assoc. North Carolina, 372.
Transformation of Rural New England, Whitney, 8.
Treatise on Hygiene and Public Health, Stevenson and Murphy, 472.
Treatment of Tuberculosis, Parsons, 284.
Victims of Wild Animals in India, Holder, 188.
Vin Mariani, 287.
Weather Predictions and Meteorology, 563.
What One Woman Says, Clara Temple Leonard, 188.
What to Do for Exercise, Harper's Young People, 189.
Written Gesture, Schooling, 376.

Macphail, A., Paralysis in Children, 204.
Mal de Mer, 182.
Manley, T. H., Garbage Disposal, 3.
Manure Disposal in New York, 301.
Martin, Ernest, Bubonic Pest in Hong Kong, 171.
Medical Excerpt, Corbally, 165, 236, 358, 486, 516.
Medico Legal Congress, 480.
Mental Power from Manual Training, Henderson, 477.
Methylsalicylic Ether in Plants, 241.
Mexican Typhus, Chico, 213.
Microbes of Bread, 123.
Microbes, Some Help we Get from, 562.
Microbites, Ed., 526.
Milk, Absorption of Odors by, 77.
Milk, Sterilized for Transportation, 239.
"Missing Link," The, Allen, 475.
Mitchell, John, Plumbing and Sanitation, 35.
Modern Sewerage Systems, 419.
Monjaras, Hygienic Instruction in Schools, 200.
Montefiore Home for Chronic Invalids, 494.
Montreal, Public Health in, Laberge, 206.
Morning Repose or Roosters? 442.
Morris, Moreau, Home Sanitation, 385.
Morris, Moreau, Infectious Diseases in Public Schools, 497.
Morse, W. F., Garbage Disposal, 137, 223, 297.
Mortality and Morbility Reports, H. K. Bell, 51, 142, 262, 340, 445, 529.

Nagle, John T., Vital Statistics of New York, 23.
National Board of Health, 289.
Navy, Surgeon-General's Report, 254.
Necessity of Frequent Visits, Ed., 525.
Negro Progress, Ed., 443.
New York Tenement-Houses, Ed., 173.
New York's Water Supply, 564.
Nutrition in Chronic Phthisis, Robin, 516.

Obituary.
John Mills Browne, M.D., 71
John W. Byron, M.D., 549.
W. S. W. Ruschenberger, M.D., U. S. N., 445.
Odors, Milk Absorption of, 77.
Official, A New, under Reform Sway, Ed., 525.
Ohmann-Dumesnill, Gold as Medicine, 236.
Old-Fashioned Nursing Methods, 321.
Overcrowded Tenements, Berlin, 77.
Oyster, The Scandal on, Ed., 179.
Oysters as Conveyors of Disease, Chancellor, 195.
Ozone, Production of, 367.

Papine as a Sedative, Hyde, 517.
Paquin, Paul, Marriage of Consumptives, 25.
Paralysis in Children, Macphail, 204.
Penalties of Ignorance, Lady Priestley, 476.
Peptenzyme as a Digestive, 486.
Period of Death as Indicated by Natural History, Meguin, 495.
Peroxide of Hydrogen, H. Endemann, 165.
Physicians, Average Duration of Life of, 548.

Physiology in Schools, Fortier, 203.
Plumbing and Sanitation, Mitchell, 35.
Pneumatic System for Small Sewerage Works, Fairley, 511.
Police Statistics, 365.
Poultry, Time it Takes to Putrefy, Wilson, 158.
Practical Quarantine in England, 76.
Prevention of Gout, Donlin, 234
Prevention of the Spread of Yellow-Fever, Formento, 134.
Prognosis in Typhoid-Fever, 359.
Provisional Arrangement of Causes of Death, Wilbur, 204.
Public Health in Montreal, Laberge, 206.
Pure Water, Ed., 441.
Putrid Poultry, Wilson, 158.

Quarantine Appliances, Montizambert, 29.
Quarantine, Canadian, Dr. Montizambert's Report, 470.
Quarantine Examination by Electric Light, 526.
Quarantine, New York, Dr. Jenkins' Report, 465.

Rauch, John H., Tribute to, 211.
Refuse and Garbage Disposal, Morse, 223.
Reed, T. D., Inspection of School-Children's Eyesight, 202.
Reid, Janet, On a Comfortable Cup of Tea, 514.
Restriction and Prevention of Tuberculosis, Worden, 24.
Robin, M., Nutrition in Chronic Phthisis, 516.
Ruschenberger, W. S. W., Obituary, 445.

Saline Digestion, Dastre, 239.
Sand Filtration of Water, with Results, Fuller, 37.
Sanitarium for Consumptives, 427.
Sanitary Brushwood Picked up in Europe, Chancellor, 193.
Sanitary Climatology, Harrington, 182.
Sanitary Engineering, Gerhard, 213.
Sanitary Patents, 96, 192, 382, 527.
Santa de Pietra, Antiseptic Clothing, 140.
School Hygiene, Brennan, 202.
Schoolhouse Sanitation, 315.
Science in the Same Boat as Theology, Stead, 475.
Secret of Long Life, Saint-Hilaire, 373.
Serum Therapy, Lebreton, 358.
Sewell, H., Climatic Segregation of Consumptives, 25.
Sewer Air and Diphtheria, 233.
Sewerage of Amsterdam, Downes, 508.
Sewerage for Small Towns, Fairley, 511.
Sewerage in Foreign Cities, Chancellor, 409, 508.
S. P. C. A. against the Use of Curs for the Promotion of Surgery, 521.
Staple Manure, 301.
Stable Nuisances in Brooklyn, Ed., 363.
Sterilized Milk for Transportation, 239.
Stewart, D. H., Garbage Disposal, 97.
Subcutaneous Injections in Tuberculous Children, 438.
Syphilitic Glossitis, Mendil, 240.

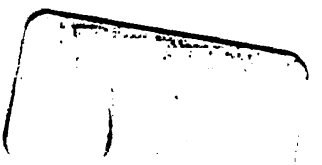
Taillat, Antiseptic Properties of Formic Acid, 167.
Tammanyism in Detroit, 366.
Tanner, J. A., Alcoholism and "Gold Cures," 326.
Tax on Doctors, 444.
Tea, On a Comfortable Cup of, Janet Reid, 514.
Temperance Drink, 366.
Temperance Teaching, Lincoln, 434.
Tenement-Houses, New York, Ed., 173.
Test of Water Pollution from Cesspool, 518.
Thirst for Amusements, Chancellor, 194.
Thresh, J. C., Interpretation of Water Analysis, 47.
Tramp Life, Josiah Flint, 478.
Trional in Insomnia, 437.
Typhoid-Fever, Cold-Water Treatment of, Chancellor, 196.
Typhoid-Fever in Children, Moussons, 238.
Typhus, Mexican, Chico, 213.

Utilization of Sewage, Chancellor, 416.

Vaccination, Community without, 246.
Vaccination, Quarantine, or Small-pox? Judicial Decision, 520.
Ventilation of Schoolhouses, Knight, 190; Doré, 208.
Vin Mariani, 287.
Visits, Necessity of Frequent, 525.
Vital Statistics of Brooklyn, 154.
Vital Statistics of New York, Nagle, 23.
Voluntary Age, Sydney Smith, 141.

Waring, Colonel George E., Street-Cleaning Commissioner, 179.
Water Analysis, Interpretation of, Thresh, 47.
Water Basin, The Long Island, Bell, 322.

Water of the Ocean, Gold in, 515.
Water Supply, London, Greenwood, 217.
" We," 222.
Weather and the Grip, 248.
What Constitutes a Drink, Ed., 527.
Wheeler's Tissue Phosphates, 436.
Whence for Health and Comfort, Ed., 523.
Wilbur, C. L., Causes of Death, 204.
Wilson, E. H., Putrid Poultry, 158.
Worden, N. E., Restriction and Prevention of Tuberculosis, 24.
Work of the Sanitary Engineer, Gerhard, 481.
Wound of Abdominal Organs, 361.

Yandell, D. W., Hon., 445.
Yellow-fever, Prevention of the Spread of, Formento, 134.

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